

Radio Control

47380

CAR OF THE YEAR!
WHO TOOK TOP HONORS? Page 100

CAR ACTION

THE WORLD'S LEADING R/C CAR MAGAZINE

July 1997

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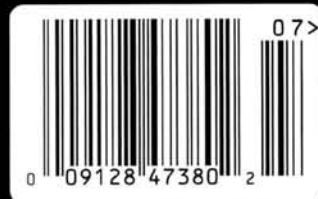
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Radio Control **CAR ACTION**

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- Performance Hobby Spring Matcher • Futaba Magnum Jr. AM Radio



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ON THE COVER (from top to bottom):
Project Big Truck III (photo by John Howell);
painting and detailing the Ferrari F-50
body (photo by Walter Sidas).

THIS PAGE (top to bottom): Tamiya's hot
new Porsche 911 GT1 (photo by Walter
Sidas); racing action from the Florida Winter
Champs (photo by John Howell); Mugen Seiki
Super Athlete (photo by Steve Casper);
PBT3 (photo by John Howell).

Keep on truckin'

I NEVER WAS A FAN of monster trucks. I liked stadium trucks, off-road buggies and ground-hugging road-race cars. I preferred vehicles that demanded finesse and precision from their pilots. Monster trucks? Forget about it; you just grab a bunch of throttle and drive over anything that gets in your path. How much fun is that?

Then Project Big Truck changed my mind. The original big-wheeled beast that appeared in our July '94 issue erased my preconceptions of sluggish acceleration, unstable handling and low-tech construction. Big Truck was a menace! With its race-developed aluminum chassis and unreal suspension travel, dual-modified motors and frighteningly large terra tires, Big Truck was an R/C driving experience like no other.

It's now 1997, and editor/author/good ole boy John "Doogie" Howell has unleashed Big Truck 3; it's bigger, faster and simply more outrageous than anything previously seen on four scaled-down tires. The subject of this month's cover, BT3 takes monster trucking to a new level of rudeness. It has more aluminum gadgets than R2D2, a more supple suspension than your grandmother's Olds 98, and enough stump-pulling torque to win a tug-of-war against most commuter cars! Driving BT3 for the photo shoot left me in awe of this creation, and even if, like me, you never envisioned yourself behind the wheel of a snortin' monster such as this one, I urge you to read John's article in this issue. Just don't blame us if you catch yourself saying "Yee-haw" for seemingly inexplicable reasons.

■ One of the most positive things to happen to the hobby is spec, or "equal playing field," racing. At the forefront of this movement is Trinity's Street Spec program, in which participants must use specially designed, low-cost chassis, and only approved tires, batteries and motors are allowed.

Contributing author Greg Vogel traveled to Trains and Lanes Hobbies in Pennsylvania to cover the '97 Street Spec Nationals (see his coverage on page 126). After learning about spec racing and talking to the participants, he is sold on this premise and is reportedly building his own spec racer to compete at next year's event!

■ Which features and traits must a car have to impress *Car Action's* editorial staff (probably the most skeptical group in the biz)? Find out this month as we give our annual "Car of the Year" award to Tamiya's TA03 touring-car chassis.

That's it for now. I hope you have as much fun reading this issue as we had putting it together.



Frank Masi, Editor-in-Chief

Radio Control CAR ACTION

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The Dangers of Lighter Fluid

I read "R/C Doctor" (March '97 issue)—"The magic of lighter fluid"—and I felt the need to write to you. I know that your readers work with some pretty toxic, flammable and otherwise dangerous chemicals; however, in this particular column, you gave some not-so-good advice. I'm glad you told readers about the product being flammable, even though they should know this.

What I have a problem with is that the author stated that this product is "pretty safe." This is very wrong: the product is made with benzene—a very toxic substance. Benzene was used in the early 1900s to clean the ink off printing presses, and it worked great. Later, we learned that benzene is absorbed by the skin, and it was proven to cause cancer, leukemia and lung disease and also shown to affect the spleen, lymph nodes and other organs of the immune system.

Because of its toxicity, it was eventually banned as a cleaning solvent. So what you have found is nothing new but a very easy way to clean with a very dangerous product—one so toxic that even using gloves doesn't really protect you from harm.

Please look at your MSDS manual at work or Haz Mat, or better yet, ask one of the guys who works on printing this great magazine about the hazards of

benzene before you recommend its use.

ANDY BODDY
Fountain Valley, CA

Big Block Baja King

Salutations to all the R/C gods at *Car Action*. I have an MRC Baja King on my workbench waiting for some serious horsepower. Some time ago, I heard that MRC had plans to produce a nitro-powered World Scale vehicle, but I never heard anything more on that topic. Please let me know whether MRC or any other company intends to release a nitro conversion for World Scale vehicles.

AARON MORRIS
Tacoma, WA

Hold your horses, Aaron!—or should I say "ponies"? At a recent press conference, MRC announced that they will release a nitro-powered World Scale vehicle. I'm sure they will also offer a conversion kit. It will have a friction-free 2WD drive train and a .21 big-block engine, and the one word that comes to my mind is "insurance"! I think it still might be a couple of months before these kits hit the hobby shop shelves, so be patient. Good things come to those who wait. —G-Man

Looking for Mister Big

I really like looking at your mag—very interesting articles and, once in a while, you publish an article on 1/4 scale, and my heart really gets to pumping. Maybe there are more on the way—at least, I keep hoping!

I still think you produce a good mag, but remember those of us who like the big toys. If you could find it in your hearts to do so, please give us more on 1/4 scale.

JERRY CATES
via R/C Car Action online

Look no further than this issue, Jerry, as contributing author Rick Eyrich wrings out Yankee's new 1/4-scale Dodge Viper GTS. Besides our mothers, teachers and bosses, who says we don't listen? —FM

Where's 1/8 Scale?

In a recent issue, I was disappointed to see that though you covered race-winning setups on some championship cars/trucks, you failed to cover any 1/8-scale gas off-road cars.

Considering how many companies serving this market advertise in your magazine, I find this odd.

If at all possible, I would like to see some setup info on 1/8-scale. I am a subscriber and have been since the very first issue because I think you do a wonderful job (most of the time)!

JEFF SALYER
via R/C Car Action online

Rest assured, we're on the job! We have Cliff Lett's winning Kyosho Inferno MP-5 from the West Coast Gas Challenge (see coverage in the June issue) and we'll be publishing Cliff's winning setup. In fact, Cliff's car is so cool that we might never give it back! —FM

BEC to the Rescue

I have a question about my RC10B2. I'm 12 years old and this is my second car. I use a Magnum sport radio and the receiver that came with it. A pack that holds four AAs hooks into the battery plug on the receiver. There is nowhere to mount the 4-cell pack because the body is so tight on the car. The 4-cell pack powers the servo—right? Well, I'm wondering if there's any way to use the 6-cell Ni-Cd battery or a smaller pack that will fit under the body. I use a Tekin Rebel ESC. Please help.

VIPERPD
via the Internet

Well Viper, as long as your receiver has battery eliminator circuitry (a BEC system), you don't need to use any other battery than your main 6-cell pack. Most receivers now have BEC (or does your receiver date back to the early '80s? Right; I didn't think so). Plug the steering-servo lead into channel 1 on the receiver; the ESC goes into channel 2; then charge your battery, flip the switch on the ESC, and you should be all set. —Doog

Too Much Power

I recently installed a new Traxxas TRX Pro .15 engine on my Nitro Stampede, and I've been stripping spur gears ever since. The engine just puts out too much power, and within a couple of minutes, the grinding sounds start. Does anyone sell a hard-steel spur gear for the Nitro Stampede? And what about the optional Traxxas hard-steel clutch bells? Would installing one resolve my problem?

KEN VACARO
Dallas, TX

Ken, as far as I know, there are no steel spur gears for the Nitro Stampede, but I'm sure you don't need one. Install a new spur gear, then tighten the slipper-clutch nut until the slipper-clutch spring is completely compressed. Then loosen the adjustment nut 1 1/2 turns; your slipper clutch is now properly set. You might even want to loosen it a little more just to be safe.

The optional hard-steel clutch bells from Traxxas will not solve stripping problems; they're machined and hardened, however, so they'll last longer and provide a better gear mesh than the stock clutch bell.

—G-Man

WRITE TO US! We welcome your photos, drawings, comments and suggestions. Letters should be addressed to "Letters," Air Age Inc., Radio Control Car Action, 100 East Ridge, Ridgefield, CT 06877-4606. Letters may be edited for clarity and brevity, and each must include a full name and address or telephone number so that the identity of the sender can be verified. We regret that, owing to the tremendous numbers of letters we receive, we can't respond to every one.

INTERNET ADDRESSES: Frank Masi: frankm@airage.com
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In search of fun
and glory, 'cause
life's too short
to be a sheep • by Chris Chianelli

INSIDE scoop



"STREET WEAPON"

The word is hot ... hot ... hot!

This is Losi's new 4WD road machine—tentatively called the "XX-4 Street Weapon." Pictured here is one of the two original concept cars that Jack Johnson and Ron Rossetti have been testing and racing at local tracks. The Team Losi boys are currently building a few more prototypes (based on the concept cars) that will be put in the hands of a few other experienced on-road racers. The parts' designs are being finalized, and Losi expects the Street Weapon to be available by September.

Here are a few key features I know you guys are dying for: drive train is fully sealed; suspension geometry has been optimized; wheel offset and shock locations are adjustable. OK, here's a bit of engineering genius for you: a one-way/clicker assembly (much like a ratchet) allows front brakes to be dialed in as much as you want. The clicker can also be totally dialed out so you have a free-rolling, one-way-bearing type of setup on the front drive; or it can be locked for full-time 4WD/FW braking. Of course, the clicker can adjust the brakes to settings anywhere between these two—no need to disassemble the car!

Wait; there's more!: ultra-efficient belt/pulley drive-train and lightweight composite outdrive/diff halves. And, though the kit will include a body (details still being worked out as to which one), the body mounts will be fully adjustable to accept any popular sedan-style shell.

I've heard some rumblings from a few unbiased sources in the industry and the word is ... hot ... hot ... HOT!! We'll keep you posted.



Apparently, Robinson Racing Products is in touch with the new racer's needs. Here's RRP's new Six-Pack 48-pitch Pinion Starter Set; it offers an economical way to experiment with gear combinations before you invest in lightened, hardened premium racing gears. The Six-Pack includes high-quality, true-spinning, precision-cut pinions (15-, 17-, 19-, 21-, 23- and 25-tooth) that allow you to fine-tune your machine while not wasting \$\$\$\$ on super-high-end pinions you'll never use.

Also shown is Robinson's TAO3 48-pitch conversion kit. With this kit, you will be able to switch from the metric gears to the more readily available, and less expensive, 48-pitch pinions for Tamiya's very hot TAO3 parking-lot/touring-car machine. The kit comes with an adapter plate and 48- and 50-tooth spur gears.

My hat is off to Robinson for coming up with creative ways to make racing a little less expensive. Contact Robinson Racing Products, 4968 Meadow View Dr., Mariposa, CA 95338; (209) 966-2465; fax (209) 966-5937.



**PICK UP A
SIX-PACK
OF PINIONS**



LATE-BREAKING NEWS FLASH!!

Just in from the Fifth Annual Motor Man Challenge in California, our associate editor George Gonzalez reports that Hitec plans to attack the R/C racing scene with a new vengeance! A compact, one-touch-setup, high-frequency ESC featuring totally new FET technology and new FM Lynx are just two examples. A new computer radio is also rumored! Stay tuned.

INSIDE scoop

BECOME A PRO



Now RS4 owners can have the smooth efficiency of dual-belt drive. HPI's new Dual Belt Conversion Kit will give you exactly the same system as you find on the RS4 Pro. HPI claims quicker acceleration, smoother braking, higher top speeds and longer run times. All this without having to buy a whole new car? Sounds pretty good to me. The kit comes with full instructions and all the parts needed to make the conversion. I predict demand will be high for this product. Contact HPI Racing, 15321 Barranca Pky., Irvine, CA 92618; (714) 753-1099; fax (714) 753-1098.



ABC Hobby CARRERA IV

For many years, ABC Hobby Co. Ltd. has provided the Japanese market with some very cool and unique R/C products. For some reason, these products are still relatively unknown here in America. Fortunately, that appears to be changing. Here's a look at ABC's brand-new 1/10-scale 4WD Carrera IV touring car. Its features include: belt-drive system, ball differentials, 2.5mm fiberglass chassis and upper plate and adjustable rear toe-in. The Carrera looks like a no-nonsense machine. It has the right stuff—not the bright and glitzy stuff that often (but not always, for those of you about to send me a nasty email) does nothing for performance. I'll keep you posted about distribution.

Trinity Presents The SPEED GEMS Collection.



-TOPAZ-

4WD Buggy/1:10 Oval
11 Turns, 3 Winds
36,750 RPM, No.9200



-RUBY-

2WD Trucks/Buggies
16 Turns, 3 Winds
25,600 RPM, No.9201



-SAPPHIRE-

Monster Trucks, Planes, Boats
17 Turns, 1 Wind
24,150 RPM, No.9202



-DIAMOND-

1:10 On-Road/Oval
12 Turns, 2 Winds
33,750 RPM, No.9203

NEWS BRIEFS

Team Trinity's Joel Johnson came back from the 4-cell ROAR

National Championships with his 23rd victory in 1/12-scale Modified. Add this to Joel's victory at the 4-Cell Modified Indoor Championships in Cleveland, and you'll see why he can truly be called the "undisputed king of 4-cell."

Joel is amazing. He goes to these 4-cell races with no pre-race testing. The only time he gets to run a 4-cell car is at practice time when he shows up at these big races. In just a few runs, he has to tweak his car, his motor and his

The 4-cell Carpet King



Joel! You are the "M" man. Does this mean they'll have to come out with a Revolver 23j?

driving style for 4-cell carpet track. Then he beats the best 4-cell racers who do nothing but race this class all winter long! I know what you're thinking: "Chris, what about your practice ... focus ... relax ... win philosophy?" All I can say is, there's only one R/C Magic Man. It ain't you; it certainly ain't me; it's Joel Johnson! Trinity has been very lucky to have him as a loyal team driver all these years.

Congratulations,

New Liquid Diff Lube

While I'm on the subject of Joel and Trinity, here's a new product for on-road racers: Joel Johnson's new Slippage Diff Lube. Just a drop on each ball and a

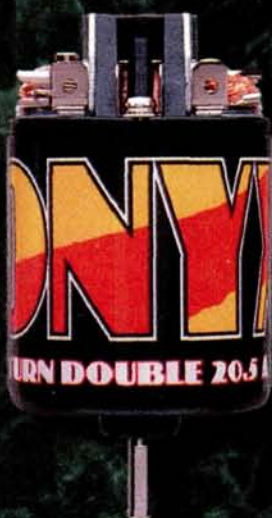
drop on your diff rings will last for several weekends of serious racing.

According to Trinity, "Your diff will feel better after each run; it will not fling off or break down with heat."

Contact Trinity Products Inc., 1901 E. Linden Ave. #8, Linden, NJ 07036; (908) 862-1705; fax (908) 862-6875.

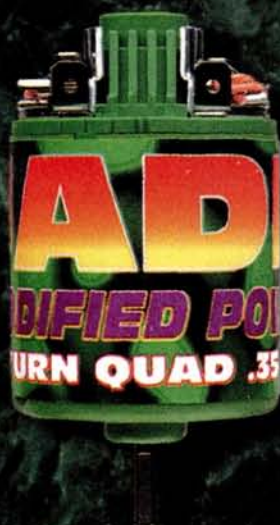


Rare Examples Of Performance And Economy.



-ONYX-

2WD Trucks/Buggies
14 Turns, 2 Winds
29,100 RPM, No. 9204



-JADE-

2WD Trucks
15 Turns, 4 Winds
27,060 RPM, No. 9206



-QUARTZ-

Touring/F-1, Planes, Boats
19 Turns, 2 Winds
21,540 RPM, No. 9207

Speed Gems machine wound modified motors are an excellent alternative for a racer on a budget. Constructed with the same superior quality components as our expensive modified motors, they have a machine wound armature. This combination produces an extremely fast motor at about half the cost of a hand wound. Only \$49.99 list. For a rare combination of performance and economy, acquire a Speed Gem today.

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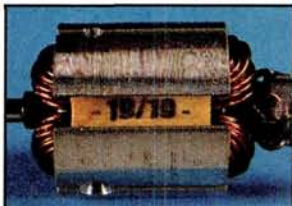


SPEED SPEC

Bad news for Cheaters

The new Point Blank Speed Spec is good news for all who try to run a fair race. Trinity has just made it easier for you to run a race that's fun, honest and equitable—one in which sportsmanship and driving talent are the true tests. On the other hand, you naughty boys who "crank" commutators, "de-wind" armatures and pull other slimy cheater tricks (and you know who you are) ... it's all over for you.

This new 24-degree modified motor was designed with modified Spec Class racing in mind. Its most important feature is its easy to identify "tamper-proof" armature. The drill-balanced

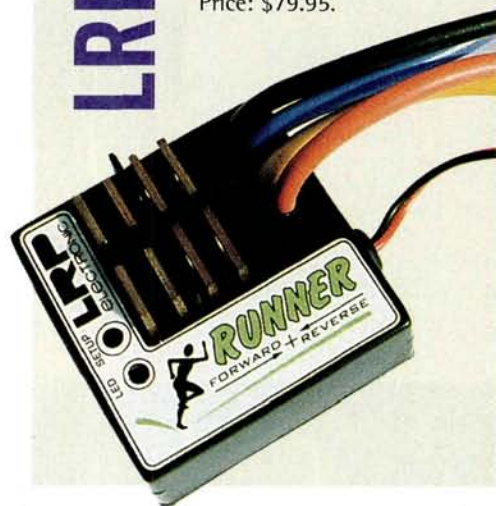


19-turn armature (with 19-gauge wire) is marked with ID tags between each pole so it can be torn down and inspected after a race to verify its legality. The motor comes with Trinity's popular 4383 Serrated Silver brushes, and

their RC-4028 Gold motor springs (medium tension). For more info on the new Speed Spec motor (part no. P191), contact Trinity Products Inc., 1901 E. Linden Ave. #8, Linden, NJ 07036; (908) 862-1705; fax (908) 862-6875.

LRP RUNNER

Associated now offers the LRP Runner electronic speed control—LRP's high quality in a reversing sport ESC. This digital, high-frequency controller was designed for 20-turn or higher motors and features EMK braking and thermal protection. Price: \$79.95.



Incredible Aveox power

Aveox recently released a new brushless motor designed specifically for R/C car use. The new RC7 car motor/ESC system will work with as few as 6 cells. Previous Aveox motors required at least twice as many to gain the torque and efficiency benefits these masterpieces have to offer. The new

RC7 is also much smaller than previous models—about the size of a typical .05 competition stock motor. The RC7 is reported to deliver three times as much torque as



Now on
6 cells!

a stock-class motor and the rpm of a hot modified. Aveox further claims a 30-percent duration advantage over standard brush/commutator-type motors. Its other features include variable timing, programmable rpm and fully proportional brakes, and reverse rotation is as simple

as pressing a button. Aveox Electric Flight Systems, P.O. Box 1287, Agoura Hills, CA 91376; (818) 597-8915; fax (818) 597-0617.

"Readers' Rides" is our way of recognizing the unique, innovative—and sometimes bizarre!—vehicles that our readers have created. Send us a sharp, uncluttered, well-exposed color photo of your car or truck (no Polaroids, please!), along with a brief description, to Readers' Rides, R/C Car Action, 100 East Ridge, Ridgefield, CT 06877-4606. If we choose to feature your creation, you'll receive a 6-month subscription to Car Action, or an extension of your existing subscription. You'll also be eligible for the seventh annual "Readers' Rides of the Year Contest" in the fall of 1997. The winner will be awarded \$500 and an assortment of electronic R/C equipment furnished by Novak Electronics Inc. Our second and third choices will also receive an assortment of Novak Electronics R/C equipment. In case we need to contact you, write your address and phone number on your letter and on the back of every photo you send. Good luck!



BULL-HEADED MONSTER

This wheelie-poppin' monster is Chris Adams' creation. He started with a complete ESP Clodzilla IV kit and added an ESP front and rear ball-bearing steering kit and installed MIP gold shock shafts to his bouncers. He uses a Tekin 420 G2 speed control, Trinity Onyx motors, Futaba radio gear, a Dynamite micro receiver, and he tops it all off with a Parma Grave Digger body.

HEY, YOU WILD THING

Jon Morgan of Rome, GA, made some conversions on his Mugen Sport 7 for greater performance and style. He widened the chassis by attaching aluminum side plates, used a Paris Racing Picco 21 engine with a tuned pipe, added universal joint driveshafts and a u-joint center shaft and topped it off with a Kyosho body. He also used an Alpina PCM radio and NES 507 servos. Sounds like you've got a real wild child on your hands, Jon!



HIGH RIDER

Russ Barry spends most of his weekends tooling up and down the beaches of Jacksonville, FL, with the controls of this Clod Buster in his hands. Russ hops the dunes with a polished-aluminum chassis with machined-aluminum front and rear bumpers; powers his Clod with two Trinity Sapphire motors; and controls it with a Tempest HyperFET ESC with JR Remote Control transmitter and receiver. He topped it off with a Chevy body shell painted grape pearl with pink holographic pinstriping.



VERY VERDE VECTRA

Joe Lu of San Jose, CA, sent us this photo of his Tamiya HKS Opel Vectra painted BMW green. He achieves "amazing top speeds" with a Speedworks Oval Man 13-turn motor and a Tekin G-12 speed control powered by a 7-cell pack. Good luck with this parking-lot master, Joe!

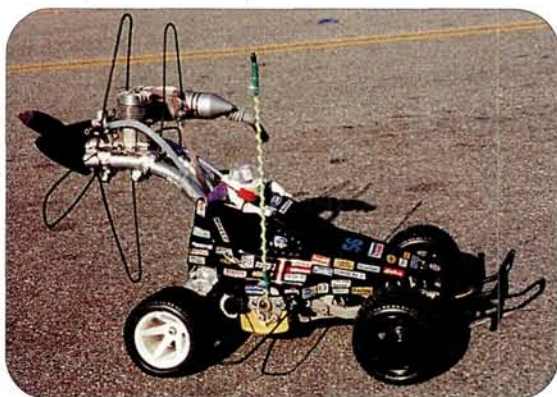
READERS' rides



THE GIFT THAT KEEPS ON GIVING

Jason McCormack of Ypsilanti, MI, hasn't stopped upgrading this Losi Double-X 'CR' since he purchased it last Christmas. Rather than run it stock, he added RPM A-arms up front and Losi graphite A-arms in back; installed a complete set of Lunsford Punisher titanium turnbuckles and hinge pins; exchanged the kit steering bellcrank with a ball-bearing steering kit; gave the buggy a graphite chassis brace; and asked his friend to fashion an aluminum rear pivot support. He controls it with a Futaba

Magnum Junior radio and Novak Rooster speed control. The crazy air-brush job was completed by Chuck Hartmeyer, Jason's friend. Looks as if you've both been pretty busy since Christmas!



BUDGET HOMEBUILT GASSER

Jimmy Kontos of Westminster, CA, thought \$900 was far too much to spend on the gas car he wanted, so he decided to build one using his 8-year-old Tamiya Frog. He fitted a 5-ounce Ronson lighter-fuel bottle into the bottom battery compartment to use as a smoker tank; added a 6-ounce fuel tank; bent the electrical conduit to mount the engine on the car; used radiator hose clamps to fasten the homemade, steel roll bars into place; used an O.S. .46 airplane engine; and topped it off with "Buzz Lightyear" as the driver. This crazy conglomeration of parts is a performer, too; it runs up nearly vertical hills and can plow through four inches of water!

NITRO POWER

Bill Bellin of Wrightstown, WI, simply calls his stadium truck "Nitro Power." His RC10GT uses mods from Associated, Boca Bearing, Hammad

Ghuman, Lunsford, MIP, RPM and Robinson Racing Products, all built on a Composite Craft chassis. Bill included an O.S. CZ-Z engine with a CV carburetor, a ported and polished stock manifold and a TS 1000 muffler. A machinist by trade, Bill was able to maximize his truck's performance even further with additional customized parts. He controls it with Futaba 9304 servos and a KO Propo Precious EX-1 radio system.



SEVEN-YEAR-OLD KING

Tony Martin of Harrison, NY, sent this photo of his Tamiya King Cab. Tony has run it off a Reedy 14T triple motor and stock gearing for the past seven years, although he has added a Thorp differential and full bearings. It grips the road or dirt with Pro-Line Dirt Hawg tires mounted on HPI's Super Star chrome wheels, gets its orders through Futaba radio gear and for power, Tony recently upgraded to Sanyo RC-2000 cells. The sharp-looking body was customized by Motion Graphics. Its great appearance and performance have stood the test of time quite well!

NOVAK
ELECTRONICS, INC. RACING TEAM



TRUBLE SHOOTING

by Doug Mertes



JIM NEWMAN
'97

Stop the Leaking

I have a Team Losi Double-X buggy that I like very much. My only problem is with the Hydra Drive unit. Ever since I built the car three years ago, the Hydra Drive has been leaking. I bought and installed a rebuild kit, but that didn't stop the leakage. My friend had the same problem, but his stopped leaking after he installed the rebuild kit. What should I do?

ERIC WONG
La Crescenta, CA

Eric, your letter proves that you don't need to buy a new car every year to have fun—and be competitive—in this wonderful hobby of ours! I also drive a Double-X that's a couple of years old, and it serves me as well today as it did when I built it. Although I haven't had a problem with a leaking Hydra Drive, I think I have a solution to your case of the dribbles, especially if the unit leaks at the inner or outer case seams. I'd be willing to bet that when you built the Hydra Drive unit, you overtightened the small flathead screws that hold the case halves together. This partially collapses the dome, causing the edges to warp. It probably didn't start to leak until you ran the car for the first time because the silicone Hydra fluid hadn't yet been fully distributed through all the internal vanes. Unfortunately, running the car also got the case nice and warm while it was warped, so it will probably need to be replaced. Once plastic parts have been heated, they tend to assume the shape into which they've been forced. Get yourself a new case, and be very careful not to crank down too hard on those screws; your new Hydra Drive unit should give you years of pleasure.

Gas Dribbler

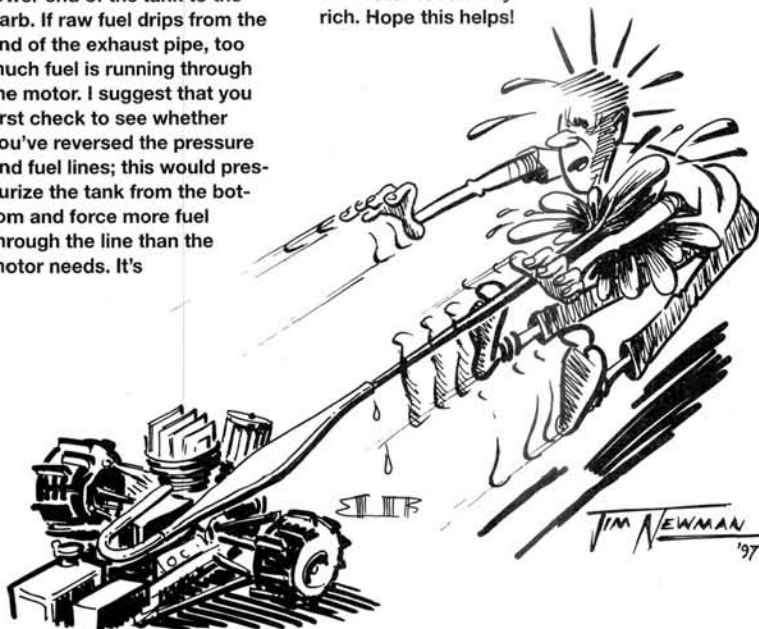
I've been in this hobby for quite a while, and about six months ago, I switched from electric to gas-powered vehicles. I own a Serpent and a gas buggy, and I recently bought an Associated RC10GT with an MIP Stinger pipe. My problem is that raw fuel drips out of the end of the tailpipe like crazy! I thought I might have to put some sort of one-way valve on the pressure line from the exhaust pipe to the fuel tank to stop this, but my friend has the same setup without the problem. I'd appreciate any help you can give me.

JOPO TOBIAS
Woodside, NY

Jopo, as you've discovered, gas and electric vehicles can wind up with problems that are as different as the methods used to power them! On almost all gas-powered cars and trucks, it's necessary to pressurize the fuel tank to ensure a constant supply of fuel to the carburetor while the engine runs. This is usually accomplished by running a low-pressure line from the expansion chamber to a fitting on the top of the fuel tank. A second rubber fuel line connects the supply tube in the lower end of the tank to the carb. If raw fuel drips from the end of the exhaust pipe, too much fuel is running through the motor. I suggest that you first check to see whether you've reversed the pressure and fuel lines; this would pressurize the tank from the bottom and force more fuel through the line than the motor needs. It's

If you have a technical problem that your hobby shop or racing friends can't resolve, give us a shout at Radio Control Car Action, and we'll see if we can chase down an answer for you. Questions should be of a technical nature and should be addressed to Troubleshooting, Radio Control Car Action, 100 East Ridge, Ridgefield, CT 06877-4606. We regret that, owing to the tremendous number of letters we receive, we can't respond to every one.

easy to make this mistake because many tanks have both line fittings at the top. Make sure that the fitting that's connected—usually through an internal tube—to the bottom of the tank is attached to the carb. If that's not the problem, the idle valve may be leaking; check the small, neoprene O-ring on the shaft for tears or gaps, and replace as necessary. The idle jet or valve may also be unscrewed so far that it doesn't regulate the fuel flow effectively. If it is, return it to the stock setting recommended by the motor's manufacturer, or screw it in until it's lightly seated, and then back it out two turns. That should at least get you in the ballpark. Finally, check the airflow through the filter. If you take the air filter off and the raw fuel stops dripping out of the pipe, the filter is probably clogging the airflow enough to cause the motor to run way rich. Hope this helps!



JIM NEWMAN
'97



TROUBLE SHOOTING

Glitch Begone!

I've been having a few problems with the steering on my HPI RS4. Once the car gets 30 or 40 feet away from me, it becomes uncontrollable. I've sent the receiver to Airtronics for repair, not once but twice, and it still does the same thing. What should I try next?

BRANDON MANDAP
Vallejo, CA

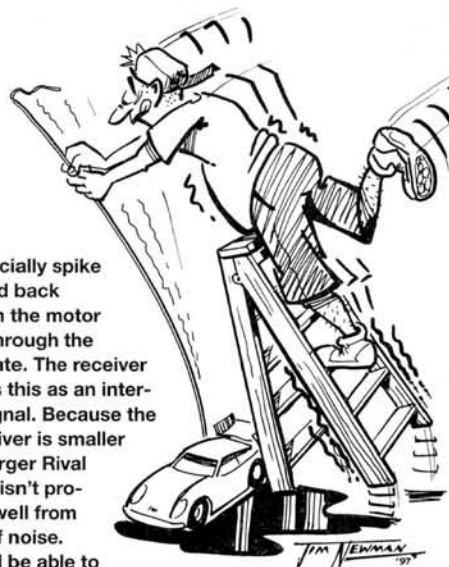
I recently bought an HPI RS4. I must say that it's a really sweet car, but whenever I run it with my Airtronics CS2P radio, it glitches very badly, even when I move my electronics around. If I install my older Rival 2P, there's no interference at all. I run my car in the wide configuration with a Trinity X-Star motor geared at 29/106, with ESP matched Sanyo 1700 batteries and a Tekin G12C speed control. When I run the CS2P in my older Yokomo YR4, there's no glitching problem, but if I put it into my friend's RS4, we have the same interference problem. Any help you could offer me would be greatly appreciated!

ANDREW HISE
Redmond, WA

Let's see, two letters from RS4 owners with Airtronics radios that glitch really badly. I think I can assist both of you sedan crazies. Although neither letter mentions it, could it be that you're both running graphite chassis on your RS4s? If so, the interference is probably caused by the motor mount. Because it's metal and is attached with metal screws directly to the main chassis plate, some volt-

age—especially spike voltage and back EMF—from the motor can run through the chassis plate. The receiver recognizes this as an interference signal. Because the CS2P receiver is smaller than the larger Rival AM unit, it isn't protected as well from this kind of noise.

You should be able to solve your problems by running a thin piece of tape (like black electrician's tape) under the motor mount to isolate the motor and effectively interrupt the current's path. Alternatively, apply a thin coat of silicone RTV or Shoe-Goo to the bottom of the mount, and let it cure overnight. If your problem persists, put two or three layers of servo tape under the receiver, and make sure that the antenna wire hasn't been cut or chafed and that it isn't routed along the chassis. To avoid interference, I always use a super-long antenna straw (check out model railroad or R/C airplane shops), and mount the crystal side of the receiver away from the chassis. Still having trouble? Check the voltage output from the ESC to the receiver; if it's getting less than 4 volts, it won't function properly.



It's Really, Really Fast in Reverse

I have a problem with the Hitec SP-520 Plus speed control that I bought about a year ago: the car goes faster in reverse than it does in forward! I've tried using the reversing switches on the transmitter and switching the negative and positive motor leads, but that hasn't solved the problem. When I first installed the speed control, I noticed a bit of smoke coming from it, but it still works. Please help me out!

VUONG DANG
Sunnyvale, CA

Vuong, your letter reminds me of a guy I used to race with eight or nine years ago. We ran on a dirt oval, and every week, this fellow showed up with a newer, hairier, nastier modified motor mounted in his truck. For some reason, however, he just wasn't able to keep up with the rest of us, who

were running stock motors. After a couple of months, as you can imagine, he got pretty discouraged. One night, he got into trouble far from any available corner marshal, and he used reverse to get back into the race. Man, could his truck go backward! We sat down and talked afterward, and I took a close look at his wiring. For almost two months, he'd been running with his speed control setup reversed! The negative wire was running to the positive lead and vice versa, so full throttle was actually full-speed reverse. Because reverse voltage on most speed controls is less than forward voltage, he could never go very fast, no matter which motor he put in. To solve your dilemma, start by pulling out the manual for your Hitec ESC and making sure you know the polarity of the wires that should be connected

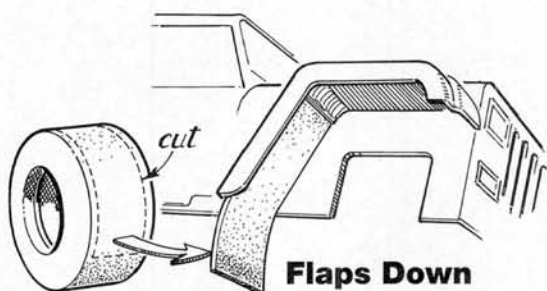
to the motor and battery; the motor should have a teeny (+/-) sign by the positive terminal. If possible, your radio's trigger or throttle stick should be set at 70 percent forward travel and 30 percent brakes/reverse. Reset the neutral point on the ESC according to the directions. If the car goes backward when you pull the throttle, reverse the servo switch. Never reverse the polarity of the motor leads to fix this kind of problem: because of their timing, most motors will run slower and hotter when they are reversed. Finally, your electronics should never, ever smoke. If your problems persist after you've checked the polarity and wiring connections, it may be necessary to return your ESC to Hitec for repairs.





PIT TIPS

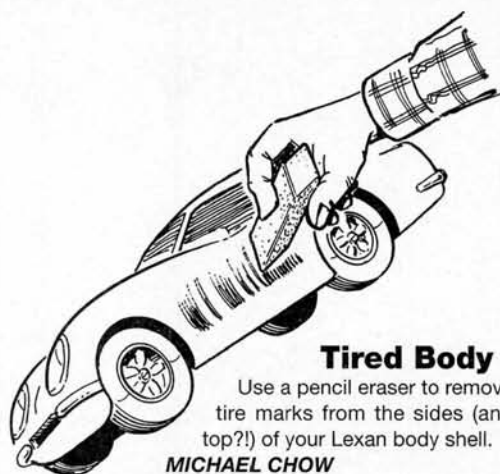
by Jim Newman



Flaps Down

To make mud flaps for your off-road vehicles, cut strips of tread off old tires and glue them under the fenders.

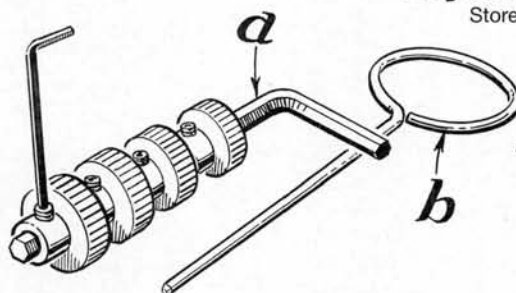
ADAM BALL
Hinsdale, IL



Tired Body

Use a pencil eraser to remove tire marks from the sides (and top?!) of your Lexan body shell.

MICHAEL CHOW
Thornhill, Ontario, Canada



Keyed Up

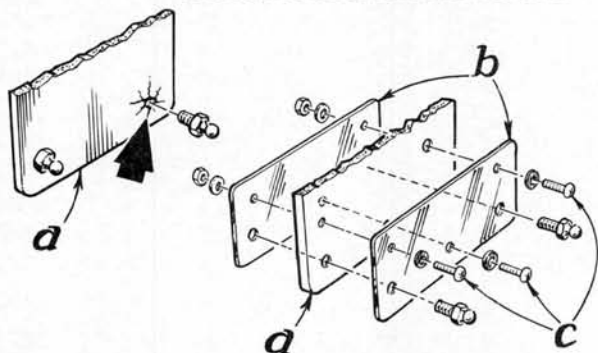
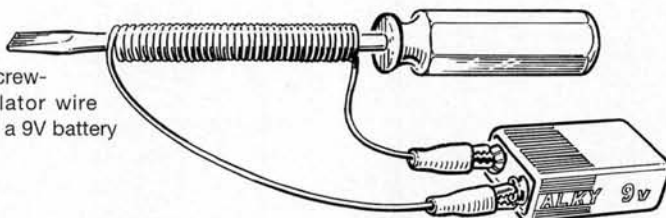
Store spare pinions on an old $\frac{3}{32}$ -inch Allen key (a) or a looped piece of coat-hanger wire (b).

RYAN HOOD
Pittsfield, MA

Quick Picker-Up

Retrieve dropped steel screws, etc., with the magnetized shaft of your screwdriver. Wind several coils of insulator wire around the shaft, and run power from a 9V battery through it for a few minutes.

JOHN CORBET
Lane Cove, NSW, Australia



Chassis Fixer-Upper

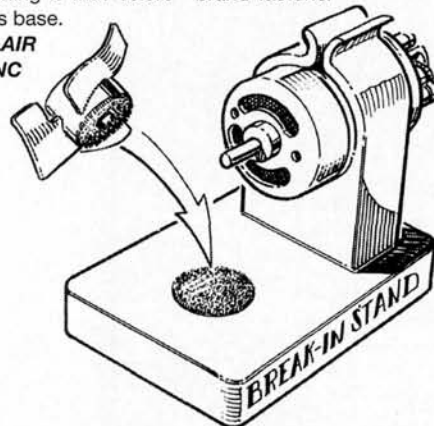
On those monster trucks, the radius-arm ball mounts (a) take a beating, and you might find cracks around the holes in them. To help spread the load and avoid this, sandwich the mounts between $\frac{1}{32}$ -inch aluminum plates (b) using additional screws (c).

BILLY DOAN
Evarts, KY

Fan-Tastic Idea

Avoid misplacing the fan when your break-in stand is not in use by fastening it with Velcro®-brand fastener to the stand's base.

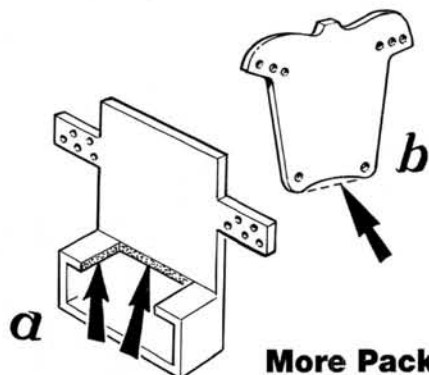
ROBERT BLAIR
Matthews, NC





PIT TIPS

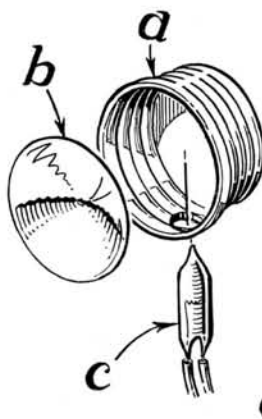
(Continued from page 38)



More Pack Room

The Losi JR T and Associated RC10T2 don't have enough room for stick packs or packs with endcaps or heat-shrink sleeve. To make them fit, trim material off the rear bulkhead (a) and the bottom of the rear shock tower (b).

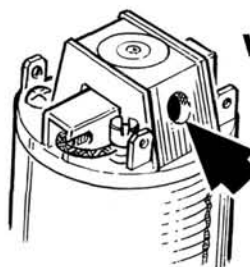
STEVE ROHR
Mattoon, IL



Let there be Light

Make a spotlight for your truck using only a 2-liter-bottle cap (a), an aluminum foil reflector (b), a clear, mini, Christmas-tree light (c) and a "lens" (d) cut from a pill "blister" pack. Glue them together with CA as shown, and use a 9V battery for power.

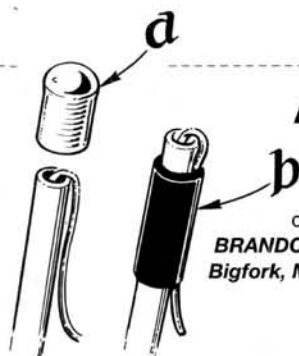
CHARLES MARLOTT
Addison, IL



Viewing Port

For a clear view of the armature and brushes, drill a hole in the sides of your endbell. Before you start drilling, remove the armature to avoid damaging it.

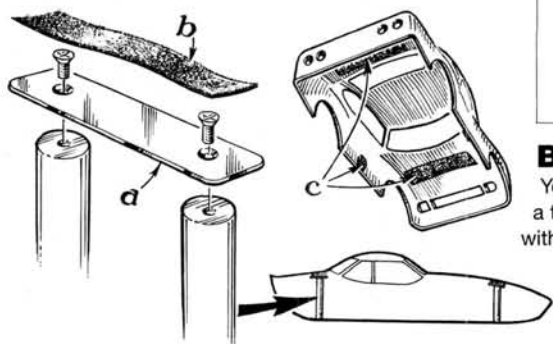
JIM GIBSON
Lake Havasu, AZ



A Better Tip

Replace easily lost plastic antenna caps (a) with a piece of heat-shrink sleeve (b). A dab of sealant in the top of the antenna tube will seal the sleeve.

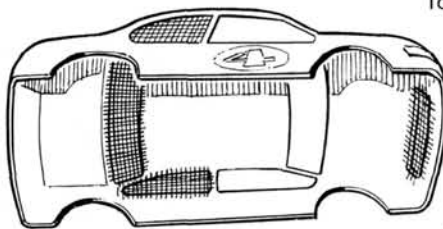
BRANDON MORROW
Bigfork, MT



Blind Mounts

You don't have to mar your R/C body shell by drilling mounting holes in it. Attach a thin plastic or aluminum plate (a) to the top of the front and rear mounting posts with countersunk screws. Glue a strip of Velcro®-brand fastener (b) to each plate and to the inside of the body as shown (c), and sit the body on top of the Velcro®. It will be secure.

THOMAS CHRISTIAN
Miami, FL



Cool Car

To keep your engine cool, replace your car's rear windows with fiberglass cloth window screen material. This will allow hot air to be vented out and, if you replace the radiator grill, cool air will be sucked in.

MONTEL MILBRY
Staten Island, NY

Radio Control Car Action will give a one-year subscription (or one-year renewal if you already subscribe) for each idea used in "Pit Tips." Send a rough sketch to Jim Newman, c/o Radio Control Car Action, 100 East Ridge, Ridgefield, CT 06877-4606. BE SURE YOUR NAME AND ADDRESS ARE CLEARLY PRINTED ON EACH SKETCH, PHOTO AND NOTE YOU SUBMIT. We're unable to publish many good tips because we don't have the sender's name and address. Please note: because of the number of ideas we receive, we can neither acknowledge every one, nor can we return unused material.



by George M. Gonzalez

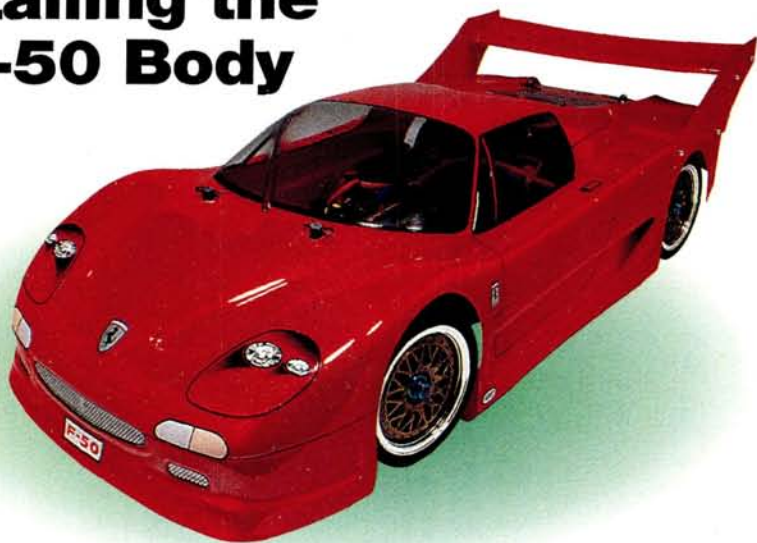
Painting and Detailing the Frewer Ferrari F-50 Body

THE FREWER* Ferrari F-50 body (part no. FR-4013) for narrow touring cars doesn't require a fancy, custom paint job to look good. It's highly detailed and includes a complete set of decals, so all that's required to create a stunning paint scheme is a single can of paint and a detailing pen. The F-50 isn't all show and no go, though; it features an aerodynamic high-downforce design and has a giant, adjustable rear wing, which also provides a great deal of downforce. Early reports conclude that the F-50 is one of the

best handling touring-car bodies available. The F-50 shown here was painted with Pactra* bright red

spray paint and detailed with a Trinity* EX-Pen. Although producing a single-color paint job

with spray paint is fairly easy, here are some tips to make the job go even more smoothly.



•Associated* BMW DTM body (part no. 6138) for the DS parking-lot racer. This beautifully detailed body fits the DS like a glove. The flared fenders and rear wing really make it stand out. This particular body was custom-painted by Scot Bich from Bich'n Bodies*.

COOL NEW PRODUCTS

• Tamiya* Porsche 911 GT1 body for the 1/8-scale TGX-Mk.1. This is by far one of the most detailed bodies available for R/C cars. It comes with more than 100 decals, separate side mirrors and a huge two-piece wing. At present, it's available only with the TGX car kit, but Tamiya plans to release a separate body set in the near future. Give Tamiya a call for prices and availability.



• New wheels for touring cars. These awesome-looking gold-plated 5-spoke wheels (below on left) from Kawada* (TU-28G) are available in wide and narrow configurations, and their hubcaps actually hide the 4mm nut that secures the wheels to the axles. Mount these on your touring car, and you'll have the makings of a concours-winning ride.



• Also new from Kawada are these Dish Plated wheels for Tamiya M-chassis cars (above on right). They have brushed-aluminum-look dishes with multiple slots—definitely a welcome addition for any M-chassis car.

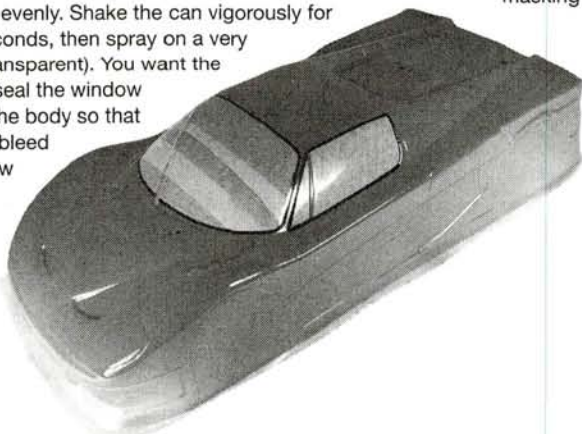
PHOTOS BY GEORGE M. GONZALEZ AND WALTER SITAS

1 Preparation

Give the body a bath in soapy water, then dry it with paper towels. Before you start to mask, you might also want to let it air dry for a few minutes.

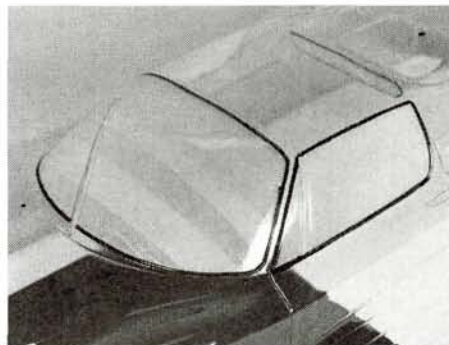
3 First coat of paint

Place the spray-paint can (Pactra's bright red) in a pan of hot water, and let it sit for a few minutes. This will ensure that the paint sprays evenly. Shake the can vigorously for about 30 seconds, then spray on a very light coat (transparent). You want the first coat to seal the window masking to the body so that no paint will bleed under it. Allow 20 minutes of drying time.

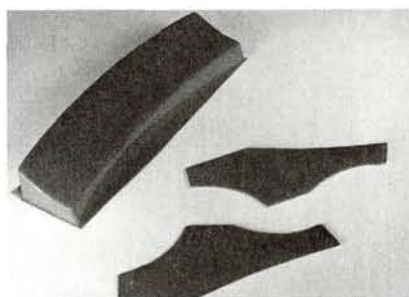


2 Masking

Using a detailing pen, on the outside of the body, draw outlines of all the window moldings (the lines can be removed later with Bolink® Body Wash, Trinity Body Blast or some motor spray that's safe for plastic). Next, mask off all the windows (on the inside of the body). With a sharp hobby knife, trim the window masking tape by using the outlines as a guide.

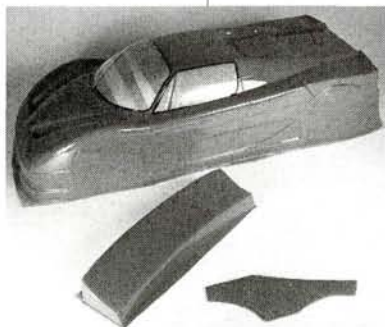


4 The wing



Don't forget this: while the body is drying, paint the wing and wing extensions. Trial-fit the wing extensions first so that you will know which side to paint.

5 Finish the job



Spray on a couple more light coats of bright red until the color is solid. Hold the body up to the light to make sure that you didn't miss any spots. Allow the body to dry for a couple of hours. (If you want to speed this up, go over the body with a hair dryer that is set on low heat.)

6 Remove the masking

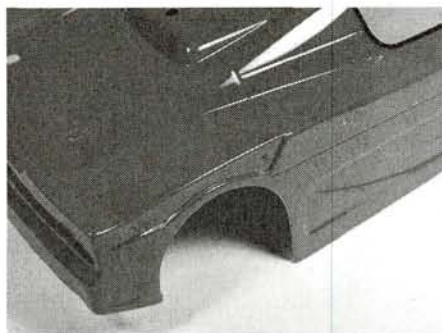


Peel off the window masking with the edge of the hobby-knife blade. Use denatured alcohol to dissolve any masking residue. At this point, you can remove the outlines with motor spray, but if you managed to draw the lines straight, leave the outlines as window moldings.

(Continued on page 47)

7 Body trimming

Cut along the body's trim lines until you have removed all the excess Lexan. Next, trim the wing. A Dremel® tool equipped with a drum sanding bit will simplify the process and yield excellent results. If you do not have a Dremel, you'll have to cut as closely to the body's trim lines as you can, then sand the edges of the body with fine-grit sandpaper until all the edges are smooth. After you've finished trimming the body, move on to the rear wing.

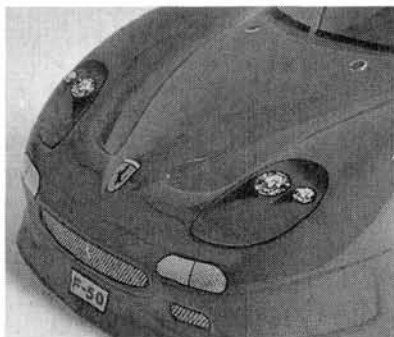




CONCOURS CORNER

(Continued from page 45)

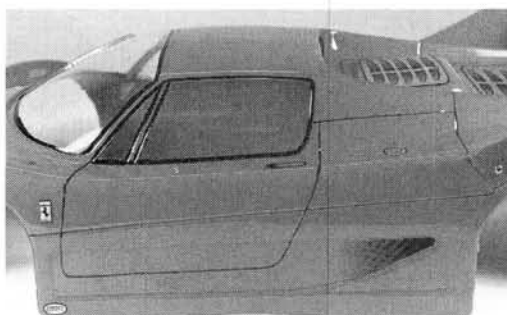
8 Decals



Cut the decals out as closely to the trim lines as you can. Fortunately, the decals do not have to go around any of the body's contours, so they can be applied dry.

9 Add realism

After you've applied the decals, add detail lines to the body with an appropriate pen. The F-50 has many molded-in detail lines that can be used as guides for the pen. I like the Trinity EX-Pen because it has two tips (thin and medium). Use the thick tip for all the window moldings and the thin one for the doors, hood, trunk and all other accents.



10 Mount the wing



Using the supplied screws and nuts, assemble the three-piece wing, then mount it on the body.

That's all there is to it. At this point, you should have a nicely detailed Ferrari F-50 body that you'll be proud to race and display. I mounted the new body on my Tamiya TA03F; this required that I cut the rear body mounts and re-drill pilot holes in each mount for the body clips. The Tamiya two-piece 300 ZX wheels are the coup de grâce. Hope you enjoyed this episode of "Concours Corner." Until next time

*Addresses are listed alphabetically in the Index of Manufacturers on page 193.

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Diff Diagnostics: Setup and Maintenance

TAKE A MOMENT to answer these questions:

- Why do you need a differential?
- Which is better—a gear diff or a ball diff?
- How do you adjust a diff for maximum performance?
- Can certain handling problems be corrected by changing diff setup?
- Is a gear diff adjustable?
- How can you rebuild your diff to regain that smooth, frictionless feel it had when it was brand-new?—without replacing all the parts.

Confused? Read on, dear friend, as the R/C Doctor leads you down the path of differential righteousness.

Diff trick for OVAL RACERS

Here's an oval racing super-secret tuning trick: set your ball diff so that it slips for the first 1½ feet or so. As you attempt to blast away at the starting tone, instead of having your rear end whip to one side or the other, you'll get super-hard, super-straight launches.

Those who race on banked concrete or asphalt tracks know that a slightly loose ball diff allows them to leave the line at the start of the race without spinning around helplessly on these notoriously traction-deficient surfaces.

Do you race a pan car on parking lots during the summer? A slightly loose ball diff will give a soft, smooth, flowing feeling to your car as it cruises around the course, and it will prevent the back end from kicking out when exiting a turn under full throttle, but you will have to replace the balls and flip the rings every couple of heats.

WHAT DO THESE THINGS DO?

A differential is a mechanical device that allows one driven wheel to operate at a different speed from that of its mate on the other side of the chassis. When your car takes a turn, its outside wheels must turn

The Tamiya ball diff on the left looks a lot like the Kyosho gear diff on the right, but their innards are completely different.

You'll also notice some resistance to how easily the opposite wheel will spin; that's an interesting tuning topic that we'll get to in a moment.

It's easy to alter diff action to obtain the handling and performance you want.

more quickly than the inside ones because they have to travel a greater distance in the same period of time. The diff makes that speed differential possible. Try this: with a motor and pinion gear installed, hold your vehicle's chassis in one hand and turn one of the driven wheels with your other hand. The matching wheel will rotate in the opposite direction to the one you're turning.

HOW DO THEY WORK?

Even though they produce more or less the same result, ball diffs and gear diffs work in very different ways.

- **Ball diff.** A typical ball diff has two smooth-faced diff halves, each of which is attached to a drive hub (in a solid-axle car), or outdrives/pressure plates (in a car with independent suspension).

A polished ring is keyed to each diff half or pressure plate. Between the diff halves/rings, there's a diff gear (or a diff pulley, in a belt-driven car) in which a series of holes has been added. Each hole is filled with a small, lubricated ball that is just a little thicker in diameter than the diff gear or pulley. The diff halves/rings "sandwich" the diff gear and ride on the surface of the balls that protrude from either side of the gear or pulley. The diff halves are held together by a long screw and nut. Tightening the screw presses the diff halves together more tightly and increases the pressure placed on the balls when the diff operates. The head of the adjustment screw rides on a separate "thrust" bearing so that the screw head may rotate freely.

- **Gear diff.** A typical gear diff also has two halves that operate independently of each other, but you won't find any lubricated balls inside a gear diff. There are two types of gear diffs: a bevel-gear diff and a planetary-gear diff. Inside a bevel-gear diff, you'll find a series of angled spider gears that mesh with the larger bevel gears. If you look inside a planetary-gear diff, you'll usually find a few small gears that rotate around a larger gear—hence, the name "planetary." Because there is no way to tighten



The ball diff revealed! The halves ride on the protruding portion of the diff balls and are secured by the screw and thrust bearing. The screw is also used to adjust the pressure provided by the conical spring washers. In this design, the drive cups plug into the sockets on each side of the assembly.

a gear diff, most racers believe that they can't be adjusted. Well, that isn't necessarily the case, as we'll soon see.

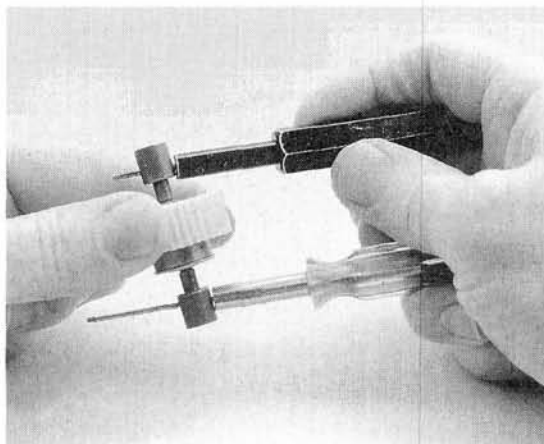
WHICH IS BETTER—GEAR OR BALL?

Because most race-oriented R/C vehicles come with a ball diff, everyone figures that gear diffs must be inferior—right? It ain't necessarily so!

Diff action—the ease with which the driven wheels will spin in opposite directions—has a terrific impact on handling. Generally speaking, a looser diff, i.e., one that operates more freely, results in greater traction for the driven wheels. For 2WD cars, that means better punch out of the corners (but less turn-in steering), and for 4WD cars, it means more responsive steering out of the front diff (occasionally, too much).

Conversely, "stiffer" diff action results in reduced traction to the driven wheels because some of the tires' adhesion will be lost when overcoming the diff's resistance.

Which is better for you depends on what you want. Ball diffs are easy to rebuild and adjust (even between heats), so they're the favorites of serious racers everywhere. On the other hand, a gear diff is simple to assemble, it provides excellent diff action with minimal resistance, and it requires virtually no maintenance (I have a truck with a gear diff that hasn't been serviced in five years, and it still does its job very well). Unfortunately, because of its design, a gear diff with very loose action can be a real handful on a slippery, dusty surface. That's because the internal gears tend to "unload" and allow one wheel to spin too freely.



To set the pressure on a ball diff, insert an Allen driver into each drive cup; then try to turn the drive gear. Tighten the diff adjustment screw a little at a time until you get to the point at which the drive gear just stops slipping.

DIAL-IN DA DIFF

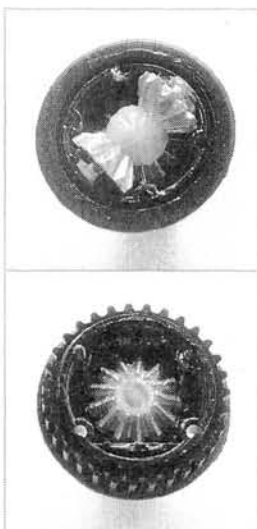
It's easy to alter diff action to obtain the handling and performance you want. Just remember this: a looser diff equals more traction and a tight diff equals less traction.

Want more rear-end traction (less steering) on your 2WD vehicle? Loosen the ball diff as

much as you can without allowing it to slip under acceleration. Keep in mind, however, that running an overly loose ball diff will damage the diff gear, diff rings and diff balls, so be careful. Want more steering? Tighten the ball diff a little more.

You can also get more steering out of a 4WD vehicle by loosening its front diff, especially if you also tighten the rear diff. If you want less steering, loosen the rear diff a tad or tighten the front diff. Starting to get the idea? You could also adjust a ball diff by using a thicker, stickier diff lube (such as those by Associated*, Losi* and Trinity*). Generally speaking, the stickier the lubricant (smoosh some between your thumb and forefinger and see how easy it is to pull them apart), the greater the resistance to differential action (keep in mind, however, that Associated and Losi ball diffs work best when you use the supplied diff grease).

Gear diffs may also be adjusted. To loosen a gear diff, coat the internal gears with a light film of Tamiya* Ceramic Grease or Aero Car* Gear Diff Lube. The result will be ultra-smooth action. To



This gear diff has bevel gears that rotate on short axles attached to the inner edge of the drive gear. On a gear diff like this, you can alter the resistance by increasing the quantity of grease inside the case, or by using grease of different viscosities and types.



NEW FROM NOVAK



THE FUTURE IS HERE!

Once again Novak has designed a product that truly surpasses the competition. The **Novak Cyclone** is a fully programmable, microprocessor controlled speed control using state of the art components to deliver the best possible performance with the **smallest size** (1.73" x 1.10" x 0.79") and **lightest weight** (1.44 oz.).

Designed to provide high performance operation and flexibility, the Cyclone is packed with these competitive features:

- **Highest motor control frequency** (up to 23,400 Hz)
 - **Three times as many discrete steps as the competition** (256 discrete steps for forward and brake band). This translates into the smoothest trigger response available (0.39% per step).
 - **Highest speed response to transmitter signal.** The Cyclone ESC will respond to a command change from the transmitter in less than 500 micro seconds (0.0005 of a second).
 - **Low voltage operation.** Decision making circuitry in the Cyclone works error-free down to 2 volts.
 - **Built-in powerful 3 amp BEC circuit,** to power the radio system and most power-hungry servos without the need for an external receiver battery. The BEC circuit is fully protected from overloads and overheating.
 - **Three different user-selectable ESC profiles** to suit the desired application (off-road, on-road, touring sedan, and 1/12 scale, etc.) and one **Custom ESC Profile** (created with the optional programming software). Accessed with the One-Touch Set-Up™ button, these profiles give the racer extreme flexibility and a competitive advantage.
 - **Adjustable minimum brake** can be set from 0 to 75% with the use of a simple adjustment pot.
 - **Low resistance solder posts** for quick installation and clean replacement of any size power wires.
 - **Brake Light LED Circuitry and Brake Light LED Accessory Kit** to power two external LEDs for a realistic final touch!
- Other Novak exclusive features include **Polar Drive Technology™**, **HYPERFET II™** transistors, and **Radio Priority Circuitry™**.

Check out the Novak Cyclone Programmable ESC at your local hobby store and experience the difference!

NOVAK ELECTRONICS, INC.
18910 Teller Avenue, Irvine, CA 92612
• (714) 833-8873 •

Advertisement

Team Losi TECH TALK

LESS IS MORE

The IFMAR Pin rear tire continues to be one of the most popular for 2WD off-road cars. Though this tire's traction is usually sufficient, there's a simple trick that will help it gain even more traction. While a car is cornering and the IFMAR Pin is loaded from the side, the outside row of lugs is usually deflected, and that interferes with traction. To eliminate this inconsistency in traction, simply cut the outside row of lugs off both sides of the tire. After that, the "new" outside row of lugs will be far enough away from the edge to avoid being deflected when the car corners. Almost all the team drivers who choose the IFMAR Pin rear use this little trick.

INSULATED BATTERY PACKS

It is very important that the chassis of the XX-4—or any car, for that matter—not come into contact with any bare wires, battery bars, or exposed battery-cell edges. If it does, electric current can flow through it to other parts of the car (this is especially true with a graphite chassis). The results can be radio interference, or even a battery-pack short. To help avoid these problems on the XX-4 chassis, run a small strip of electrical tape or protective chassis tape along both sides of the foam battery pad. This will prevent the exposed parts of the cells—parts where the heat-shrink has worn away—from touching the chassis. While you're at it, stick a small piece of tape under the motor (just under the endbell). This will prevent the endbell tab from touching the chassis when you use a large pinion gear and move the motor closer to the chassis.

LOCK IT UP

The one-way/clicker assembly on the XX-4 is very cool! It allows the front braking to be adjusted anywhere from virtually nonexistent to fairly heavy. If you'd like to have even stronger front brakes, you can. Here's how: remove the small adjustment nut from the one-way/clicker assembly, then remove the spring spacer and clicker spring. Carefully (you don't want to drop it inside and have to take your car apart) place a rear axle spacer over the shaft, and align it so that it's centered on the shaft around the part with the flat sections. Place the spring spacer over the shaft, next to the axle spacer, and tighten the adjustment nut against it. The one-way/clicker should now be locked in place. The result is full-time 4WD and full braking force for both the front and rear wheels.

Let us know what's going on! Address your questions or problems to Team Losi, "Tech Talk," 13848 Magnolia Ave., Dept. J, Chino, CA 91710

R/C DOCTOR

Diff Maintenance

Over time, diffs start to feel notchy or gritty. This is usually caused by dirt that's trapped between the moving parts, dents in the diff balls, bevel gears, dirty or damaged axle bearings or thrust bearings, or grooves worn in the diff rings. Some occasional maintenance should help you avoid having to replace all these parts simultaneously.

- Completely disassemble the entire diff.
- Clean everything with a toothbrush and a motor spray that is safe for plastic.
- Inspect every part for wear, cracks or dents.

I don't have to replace diff balls as often as I used to; maybe they're of a higher quality than in years gone by. Still, they're so cheap that if you can't remember when you last replaced yours, I'd throw in a new set.

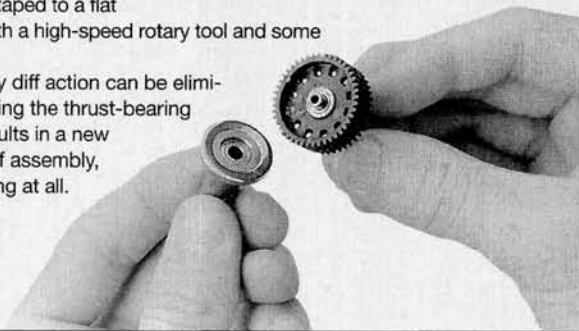
Diff housings in off-road vehicles usually last for years. But if you hear unhappy noises coming from the tranny, I suggest that you replace all of its gears.

A gear diff seems to last as long as a car; I don't remember ever buying new gears.

Badly grooved diff rings can usually be flipped over to reveal an unused side that will restore a smooth, like-new feeling to the diff. Though new rings are inexpensive, the worn rings can sometimes be "reclaimed": rub them in a "figure-8" motion over a piece of 600-grit wet-or-dry sandpaper that's taped to a flat surface, or re-polish them with a high-speed rotary tool and some Simichrome metal polish.

I've found that most nasty diff action can be eliminated by replacing or reversing the thrust-bearing washers. This frequently results in a new lease on life for the entire diff assembly, and it won't cost you anything at all.

I like the sound of that!



tighten a gear diff, liberally coat the internal gears with Tamiya grease, axle grease, petroleum jelly, the old Losi JRX-2/JRX-T diff grease that came in white containers, Associated black grease, or Trinity Purple Stuff. The result will be a differential with tighter operation.

THE BIG FINISH

I suggest that you sit down with your car or truck and fiddle with the diff until you understand what it does and how it works. If your 2WD car or truck is equipped with a gear diff, you might want to consider installing a ball diff (if one is available for your vehicle). A ball diff provides a greater range of adjustment and is much more user-friendly. But always remember that as long as it has been properly set up, in most cases, you can get away with using a gear diff.

If you have a Tamiya 4WD touring car, try replacing the front gear diff with a ball diff, and you'll be amazed at the way the car settles down on most parking-lot



This is just a fraction of my diff lube and grease collection. I'm always on the lookout for new ones to add to my tuning arsenal!

tracks. You could also install a gear diff out back and a ball diff up front to see whether you pick up some rear-end traction. Keep your tuning notebook handy, and make only one change at a time. Do a little experimenting following the "doctor's" suggestions, and you'll be closer to making your car handle just the way you want it to!

**Addresses are listed alphabetically in the Index of Manufacturers on page 193.*

FUTABA Magnum Jr. AM radio

BUDGET WAVES

Futaba* has redesigned its Magnum Junior radio—a bold move considering the Junior's longstanding reputation as the king of entry-level radios. Gone are the revolver-shaped handle and slightly top-heavy design that endured for so many years. In the revamped style, the battery pack's weight has been redistributed for better overall balance.

I thought the feel of the new design would be hard to get used to, but I was wrong; I liked it immediately. The change makes it possible for the transmitter to stand solidly on its own. And although the weight transfer makes the new radio feel lighter, it actually weighs the same as the old model.

Another useful feature is the independent steer-



to adjust the steering rate when driving. I was disappointed, though, to discover that the numbered dial used on the older Magnum Junior models has been eliminated. This dial made it easier to set or reset trim for different tracks or different tire and suspension combos.

Large throttle- and steering-trim knobs are to the right of the steering wheel. Again, printed numbers on the controls would make setting and resetting a lot easier. The on/off switch's new location will prevent the transmitter from being accidentally turned on. Have

you ever arrived at the track and found that your power has been on all along? I hate when that happens! The dial-type power meter of the old Junior has been replaced by a series of small, red and green LEDs. If all the lights are on, you have full power. When only the bottom red light is on, it's time to replace the batteries. The lights are visible behind a smoky gray door, so now you can tell from a distance whether your transmitter is on.

Overall, I think the new Futaba trans-

mitters will be a big success. I really like the look and feel, and the added features are definite pluses! (But I miss the numbered dial for the steering D/R. This is a small detail, but I think it's an important one.)

If you use a Magnum Sport but want to upgrade, or if you have the old-style Magnum Junior but want the latest look and the extra goodies, now is the time to join the new wave in radio transmitters.

—Kevin Meyer

Need to know what's new? What works well and what doesn't? This section is devoted to objective reviews of all R/C car accessory items. From gears and wrenches to motor brushes and shock springs; if you can use it with your R/C vehicle, you'll find it critiqued on these pages.



55
Futaba
Magnum Jr.
AM radio



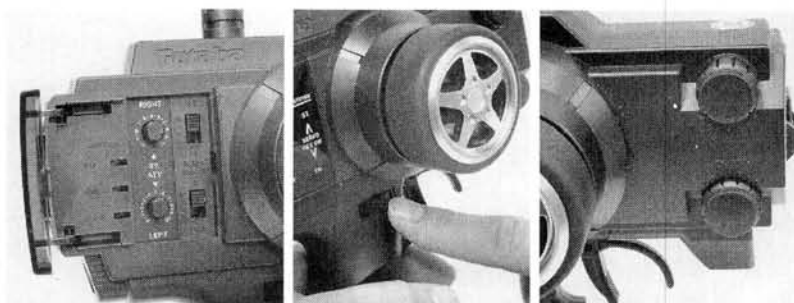
58
O.S. Max
1SRX



62
Performance
Hobby
Spring
Match



62
Performance
Hobby
Lite Switch



Left: the really cool sliding door helps prevent unintentional operation of the controls (such as when your curious child decides to play with the transmitter). **Separate adjustments for right and left steering control are another nice addition. Switches that reverse the servos are also stashed behind the sliding door. ■ Center:** the steering limiter (D/R) is easy to adjust with your thumb while you're driving, but what happened to the numbered dial? For minimum steering, turn the dial to the left; for maximum steering, turn to the right. A numbered dial would make it easier to return to previous settings. **■ Right:** steering and throttle trim are conveniently on the front panel, so it's easy to tweak steering balance and fine-tune the throttle. If these knobs were numbered, it would be easier to adjust them and to find previous settings. Perhaps a better location for them would be near the steering and servo-reversing switches.

ing-travel adjustment that allows independent adjustment of a model's right- and left-side travel. This function helps to compensate for differences in right- or left-turning radiuses among various models. This is a cool function if you're into oval racing; it allows you to dial out almost all the left steering and add steering to the right, in case you need to drive around a pileup. Steering dual rate (D/R) adjusts the travel in both directions, and that's a great feature for fine-tuning steering travel. Its position makes it easy

O.S. Max 15RX

IDEAL FOR SPORT RACERS?

BECAUSE IT was designed to meet the European Federation of Radio-operated Automobiles' (EFRA) racing specs, the new O.S.* 15RX (2.5cc) engine should prove to be a tractable, easy-to-operate engine for us to use here in the USA.

With the aim of holding back escalating engine costs, EFRA has established rigid specs (unlike in 1/8 scale). These specs are expected to ensure that these engines will be relatively mild and will have easy-to-control power characteristics—a feature that will not only be attractive to evenly matched spec gas racers, but will also meet the needs of the newcomers to the gas-racing sport.

For those interested the EFRA engine specifications they are:

- Max. displacement—2.5cc.
- Max. number of intake ports—4.
- Max. exhaust-port height—4.5mm.
- Stroke—not less than 14mm.
- Crankshaft induction bore—7mm max.
- Carb bore—6mm max.
- Methanol fuel only with max of 16 percent nitro.
- EFRA-approved pipes only; max. outlet diameter of 5.2mm.
- Only one modification allowed—different bearings.
- "Turbo" heads and "turbo" plugs aren't allowed.

The O.S. 15RX conforms with these, and on the dyno, at least, its performance is just what the EFRA committee hoped for.

MECHANICAL DETAILS

The striking matte black engine has a red heat-sink cylinder head that looks good and, more important, keeps engine temperatures down. The rigid one-piece case shows the customary O.S. care, which is also evident in other features such as the small, almost unseen, gusset that braces the front bearing housing against the carb housing. Between the two ball bearings, the housing bore has been heavily relieved in the bottom 2/5 position; this provides a nifty fuel-oil reservoir that ensures the front bearing will never be starved of oil.

The cylinder head sits on top of the cylinder liner (instead of being "plugged in"). This makes it easier to assess the squish-band clearances, and that helps to keep machining costs down.

The crankshaft is very simple and inexpensive yet highly finished and accurately machined. It features a diagonally drilled crankpin-to-induction-bore lubrication hole—a great "centrifuging" method to lubricate this high-stress crankpin area.

The chromed-brass cylinder liner has the usual Schnuerle porting with modest timing and a final blowdown period of 17 degrees; this will allow only moderate tuned-pipe performance gains. The liner features a hefty distortion-proof upper flange against which the head seats.

The high-silicon alloy piston has circular cutaways that help main transfer breathing and also keep weight down. The light aluminum-alloy connecting-rod is bushed at both ends, but neither end has lubrication holes drilled.

The usual slide-throttle carb has secondary and vertically mounted main needle controls—all O-ringed to protect against vibration and air leaks. Between the carb and the main crankcase, there's an insulation sleeve that keeps carb temperatures more constant and, therefore, needle settings more constant.

PERFORMANCE

This engine's specs led me to expect a relatively mild, but flexible, performance with a wide torque band and usable power. O.S. claims 1.18hp at 28,000rpm. That's around 84 percent of the hp/cc given by the typical 2hp of the 1/8-scale engines! Needless to say, I was very eager to check it out.

I test R/C engines by loading them with a propeller or two before I mount the engine on the dynamometer to check the rpm. A Cox 5.5x4 seemed to be right for this small engine.

There's no reason for you to do this with your engine, so don't. There isn't that much material on this prop hub to stand high-rpm centrifugal forces. I do this under highly controlled laboratory conditions, and it can be hazardous. Doing it does give me a feel for the engine's characteristics, and it prepares the engine for the dyno work. With this prop load, I recorded rpm of 28,000 to 29,000.

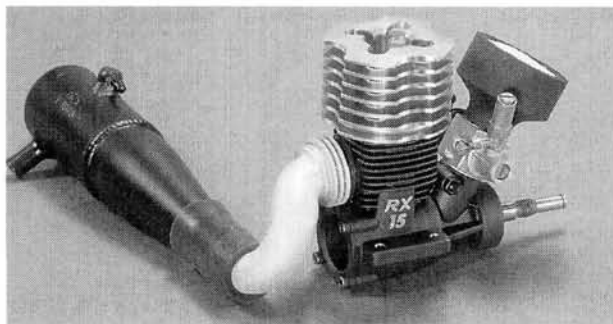
Right away, I noted the 15RX's very smooth and vibration-free performance over a considerable rpm range—a very desirable finding! Excessive vibration can cause all sorts of annoying things such as the loosening of any and all nuts, bolts and screws, and it may even cause radio interference.

I was now ready for the dyno work!—the much more "scientific" part of the evaluation!

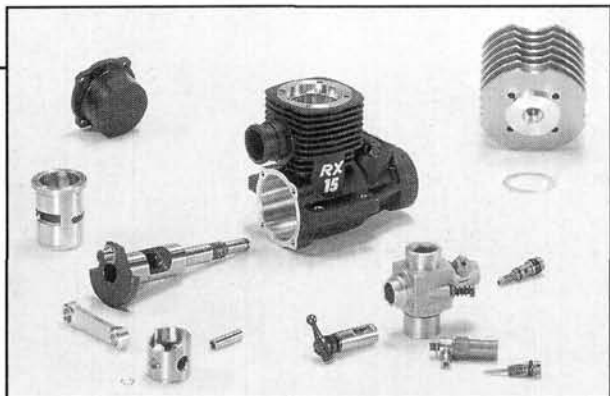
TEST 1

Open exhaust; fuel—5 percent nitro, 14 percent ML70 synthetic, 6 percent castor oils, methanol; plug—O.S. R5.

The oil percentage and plug type are what O.S. recommends. Trust



The 15RX was designed to allow only modest tuned-pipe performance gains.



Note the two holes in the piston; they assist transfer breathing. The liner's thick flange is deeply recessed in the crankcase—improved distortion-protection.

breathing restrictions and the restricted pipe outlet). I don't show this result on the graph because it would be confused with the other curves.

Going to a longer pipe of 255mm substantially reduced rpm to around 23,000 with a modest .86hp; even so, this was significantly higher hp than the open-exhaust figure obtained at that rpm. I couldn't improve on the best result obtained using 16-percent nitro (EFRA's maximum)—.91 hp at 28,500rpm.

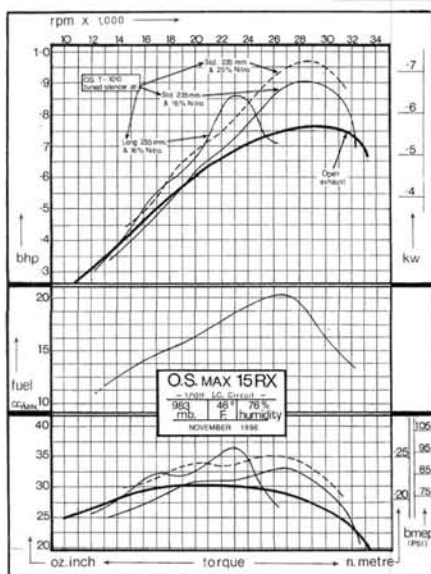
Car Action's editors suggested that the manufacturer's figure of 1.18hp might have been obtained using around 25-percent nitro (more commonly used in Japan), so I used a higher percentage of nitro and

the manufacturer; he knows best for sure. Starting at 10,000rpm and ending at 33,300rpm, the RX15's smoothness of operation was again outstanding. It was so smooth that my small dyno (I have several) easily handled it and showed just how much torque it had. The final .76hp at 29,200rpm proved the restrictive effects of the new engine regulations.

TESTS 2, 3, 4

O.S. T-1010 tuned pipe at various lengths; fuel—EFRA's 16-percent nitro (with one hp curve using 25-percent nitro).

O.S. provides a standard 70mm-long exhaust-header pipe to connect the engine to the tuned pipe. (Measured from the plug to the end of the pipe's silencer, we get an O.S. standard length of 235mm.) As the graph shows, this length actually led to the highest hp figures of this test—a little surprising because pipe shortening usually leads to more hp. In this case, shortening the pipe to 215mm led to reductions—.78hp at 30,400rpm (probably the result of the engine's



SPECIFICATIONS

WEIGHTS & DIMENSIONS

Capacity	0.1522cl (2.495cc)
Bore	0.591 in. (15.01mm)
Stroke	0.555 in. (14.097mm)
Stroke/bore ratio	0.939:1
Timing periods	Exhaust—152° (angled down 15°) Transfer—118° (angled up 15°) Boost—110° (angled up 60°) Front induction —opens 34° ABDC —closes 59° ATDC Total period—205° Blowdown—17°
Combustion volume	0.23cc
Compression ratios	Geometric—11.8:1 Effective—8.56:1
Exhaust-port height	0.168 in. (4.27mm)
Cylinder-head squish	0.016 in. (0.41mm)
Cylinder-head squish angle	4°
Squish-band width	0.131 in. (3.33mm)
Carburetor bore	0.236 in. (5.99mm)
Crankshaft diameter	0.472 in. (11.99mm)
Crankshaft bore	0.275 in. (6.99 mm)
Crankpin diameter	0.1755 in. (4.46mm)
Crankshaft nose thread	0.248 in x 28 TPI
Wristpin diameter	0.1575 in. (4.01mm)
Connecting-rod centers	1.062 in. (27mm)
Engine height	3.43 in. (87.13mm)
Width	1.77 in. (44.96mm)
Length (backplate to front bearing)	2.36 in. (60.02mm)
Width between bearers	1.173 in. (29.8mm)
Mounting-hole dimensions	1.456x0.826x0.131 in. (37x21x3.34mm)
Weight (bare)	8.35 oz. (238 gm)
—w/O.S. pipe, manifold and air cleaner	11.15 oz. (317gm)
Crankshaft weight	1.25 oz. (36 gm)
Piston weight	0.10 oz. (2.8 gm)

Performance

Maximum B.hp

0.97 at 28,800rpm (25% nitro/O.S. pipe at 235mm)
0.91 at 28,500rpm (16% nitro/O.S. pipe at 235mm)
0.77 at 28,300rpm (open exhaust/5% nitro)

Maximum torque

36.5 oz.-in. at 22,900rpm (16% nitro/pipe at 255mm)
33.2 oz.-in. at 26,900rpm (16% nitro/pipe at 235mm)
31.0 oz.-in. at 20,500rpm (5% nitro/open exhaust)

Rpm on standard props

	Open ex. 5% nitro	O.S. pipe 235mm 16% nitro	Pipe 255mm 16% nitro	Pipe 235mm 25% nitro
7x4 Taipan.....	20,900	21,120	22,430	—
7x4 APC.....	21,200	21,700	22,720	—
5.5x4 Cox.....	28,670	29,340	27,340	30,100

Performance equivalents

B.hp/ci.....	5.06	5.98	5.65	6.37
B.hp/cc.....	0.309	0.365	0.345	0.388
B.hp/lb.....	1.47	1.30	1.23	1.39
B.hp/kilo.....	3.23	2.87	2.71	3.06
Oz.-in./ci.....	203.7	218.1	239.8	230.0
Oz.-in./cc.....	12.4	13.0	14.6	14.0
Oz.-in./lb.....	59.4	47.6	52.4	50.2
N. meter/cc.....	0.089	0.095	0.104	0.100

did, in fact, note an expected jump, though only to .97hp. Clearly, using more nitro brings the engine almost to its manufacturer's claim.

During all the tests, what was important was that wonderfully smooth, effortless running already mentioned; it transcends concerns about actual power levels. Remember, hp rating alone doesn't mean much. It's *usable* power that's important. Because of its very civilized porting, friendly operation and low vibration levels, this engine's power falls in the "highly usable" category; in fact this engine is so agreeable that it would be a perfect reason to start a new gas spec series here in the USA.

—Mike Billinton

PRODUCT WATCH

PERFORMANCE HOBBY

Spring Matcher NO MORE MIS-MATCHED PAIRS

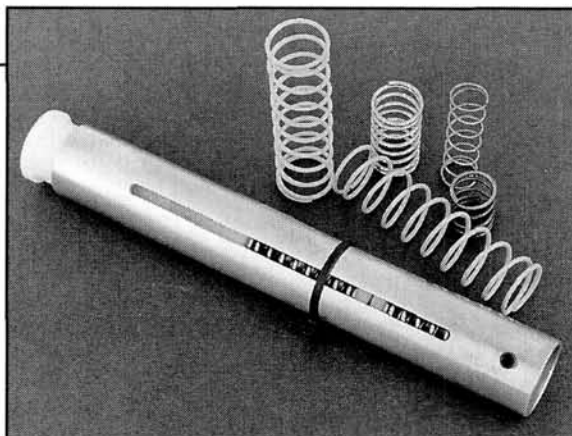


PHOTO BY PETER VIEIRA

FROM TIME to time, I'm prone to pulling a real bone-head maneuver. You see, I wanted to be like the cool factory guys, so I stripped the paint off my off-road springs so my competitors wouldn't "steal" my suspension setup. (Yep; when you're nailing down those mid-pack finishes in the C-Main, everybody wants to know your secret.) So anyway, there I was with my freshly denuded shock springs when I suddenly realized that I had no way of telling which springs were which.

After a feeble attempt at "finger-matching," I resolved to shell out the dough for a set of calipers that would allow me to determine spring stiffness by measuring the thickness of the wire coils. What a hassle! Then, by a stroke of coincidental good luck, *Car Action's* George Gonzalez sent along a neat spring-matching device from those clever guys at Performance Hobby*. Saved!

The Spring Matcher (great name, huh?) is brilliant in its simplicity. It has three components: an aluminum tube with a slot that serves as a sighting window; an indicator piston; and a stepped plunger that's used to load the test spring. There isn't a control spring, but this can be any ole off-road-type spring you have lying around. The control spring goes in first and is followed by the piston. The test spring is inserted on top of the piston and is followed by the plunger.

To test a spring, press the plunger into the tube until it reaches the first step. Use a pencil to mark the position of the indicator piston on the aluminum tube. Repeat the process for the other steps until the plunger is fully inserted. In a slight

departure from the instructions, I slid zip-ties up and down the aluminum tube to mark the position of the indicator piston (instead of marking the tube with a pencil). To match the tested spring with its mate, simply insert "suspect" springs until you find one that matches the marks you made for the first spring. The matcher works very well. In a matter of minutes, I had sorted all my springs into matched pairs.

Even if all your springs are color-coded and you don't need a matcher, the Spring Matcher is still pretty handy because it allows you to "visualize" spring rate. If the marks you made on the tube are all about the same distance from one another, then you know that a spring's rate is linear throughout the range of compression, i.e., the force needed to compress it is constant from the first inch of squeeze to the last. If the first marks you make are close together and subsequent marks are progressively farther apart, then your spring becomes stiffer as it is compressed. Vice versa, and you have a spring that starts out stiff and gets softer as it is compressed. Being able to assess spring rates in this way is pretty cool!

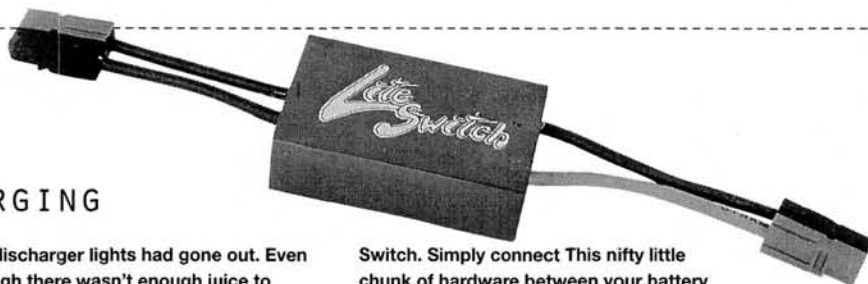
The Performance Hobby Spring Matcher is a good tuning and organizational aid for all who are interested in keeping their suspension in top shape. It's easy to use, won't weigh down your toolbox and works with any coil-over spring—sedan springs, too. But be warned: it's sure to be on your "frequently lent to others" list, so keep an eye on it!

—Peter Vieira

PERFORMANCE HOBBY

Lite Switch

AVOID OVER-DISCHARGING



"HEY, YOUR LIGHTS are out!" came the cry from the pit area, referring to my discharger bulbs.

This was yelled at me in a tone usually reserved for something more along the lines of "Your hair is on fire!" "So what?" I thought. "I'm eating a hot dog; whaddaya want me to do?—run over there?"

But now I understand why that well-meaning racer was so concerned that

my discharger lights had gone out. Even though there wasn't enough juice to make the filaments glow, those 10 no. 11 bulbs were still pulling on my battery—kind of like kicking a man when he's down. That sort of abuse can lead to cell reversal and extra internal resistance (translation: you go "slow").

Luckily, good ole technology has once again come to the rescue. Performance Hobby* offers a device that should be in your pit box: the Lite

Switch. Simply connect This nifty little chunk of hardware between your battery and discharger. Plug it in, the lights go on and as the pack nears the optimum voltage cutoff, the Lite Switch gently closes the circuit. No more light-bulb-starting matches! If this concept rings a bell, it's probably because *Car Action's* George Gonzalez took an in-depth look at the whole discharge-device scene back in the April '97 issue.

(Continued on page 183)

PHOTO BY PETER VIEIRA



thrash
TEST

1/8 scale gas

Mugen Seiki

Super Athlete

by A.R. Flatbush



MUGEN'S* name is synonymous with power and speed. In the nitro racing community, the company is a well-known manufacturer of high-quality 1/8- and 1/10-scale on- and off-road nitro vehicles. The Athlete 1/8-scale buggy helped Mugen earn its reputation for quality. In its day, the Athlete had many battles against its arch enemy, the Kyosho Inferno, and later, the Turbo Inferno. When Kyosho released their new updated MP-5 racer (its biggest improvement was its chassis with front kick-up for better handling), Mugen countered with an updated racer of their own—the Super Athlete. From the ground up, this new 1/8-scale, 4WD off-road buggy was designed to shred where others fear to tread.

WELCOME TO THE NEXT LEVEL OF 4WD NITRO



SPECIFICATIONS

SCALE 1/8
LIST PRICE \$749.99

DIMENSIONS

Length overall 18.5 in.
Wheelbase 12.68 in.
Front width 9.92 in.
Rear width 9.92 in.

WEIGHT (gross, RTR) 7 lb., 4 oz.

CHASSIS

Type Stamped plate w/ 6-degree kick-up
Material Aluminum

DRIVE TRAIN

Type Shaft-driven 4WD
Primary Clutch bell/spur gear
Transmission Front universal shafts/rear dogbones
Differential(s) 3 planetary-gear diffs
Bearings/bushings Ball bearings
Brakes Disk

SUSPENSION (F/R)

Type 4W independent w/lower A-arms/
upper adjustable links
Damping Aluminum, oil-filled, coil-over shocks

WHEELS (F/R)

Type One-piece plastic
Dimensions (DxW) 3x1.75 in.

TIRES (F/R) Mini-pin H-pattern (4.5x1.6 in)

POWERPLANT (not included)

Engine Beat .21B
Pipe Tuned
Carb Slide-valve, 8mm barrel

PHOTOS BY STEVE CASPER

SUPER ATHLETE

KIT FEATURES

• **Chassis.** Like the Kyosho MP-5, the Super Athlete has 6 degrees of front kick-up for better handling over rough terrain. The holes in the 3mm A70-75 (T6 aluminum) chassis are countersunk to ensure a flat, smooth bottom when the screws are installed, and the chassis has tabs that act as stops for the setscrews in the suspension arms. This allows you to make travel-limiting adjustments quickly without having to disassemble the shocks. Plastic side pods keep rocks and roost at bay and enhance the chassis' torsional rigidity.

• **Drive train.** The new aluminum housings for the bevel-gear differentials are sealed, so you can fill them with silicone fluid of different viscosities as a tuning option. The center diff has a 45-tooth metal spur gear, while the front and rear diffs are bevel-gear driven. New front and rear gearboxes lower the center of gravity and feature caster/toe-in blocks for tunability. Front final drive is by universal joints, while all other outdrives are dogbones.

Power is transmitted from a .21 engine by means of a lightweight, anodized-aluminum flywheel, a 3-pin clutch and a 13-tooth clutch bell/pinion gear.

• **Front suspension.** The front kingpin angle is 5 degrees; combined with the chassis kick-up and recommended caster/toe block, this yields a total front caster angle of 11 degrees. The lower A-arm offers two shock-mounting positions, while the 3mm aluminum shock tower has six upper shock holes. Front roll center is adjustable, with four outer and three inner mounts for the upper link quick-adjust. Front-wheel travel is 1.9 inches.

• **Steering system.** The twin-bellcrank steering system includes a spring-loaded servo-saver system (a bearing-equipped servo saver is offered as an option). The drag link provides enough Ackerman effect for



The new sealed diffs lower the car's overall center of gravity and can be tuned by using different silicone diff oils.



New bulkheads house tunable diffs and have adjustable toe/anti-squat blocks.



Building & Setup Tips

- Although the Mugen has an excellent sintered-metal fuel filter, an inline filter is also a good idea.
- Cut 2 inches off the kit's colored fuel line; use some for brake rubber and use the rest for the pressure lines and fuel lines. Zip-tie all connections.
- The two most important things you can do to prolong the life of your buggy are: install a throttle-return spring and keep the foam air filter clean and well-oiled. When you attach the flywheel to the engine, use two 7x14x0.5mm washers to properly space the flywheel and clutch.
- If you build the kit exactly as instructed, you'll have way too much toe-out and negative camber. Setting the front camber turnbuckles at 17.5mm (instead of 14) and rear turnbuckles at 40mm (instead of 38mm) and using the stock mounts yields 1 to 2 degrees negative camber. For slight toe-out, I set the steering turnbuckles at 33.5mm instead of 30 as the manual suggested.
- For extra strength and adjustability, use Lunford* titanium turnbuckles (1 7/8 inch) instead of the stock threaded steering-arm rods.
- For stronger and more progressive braking action, use 0.75-1.0-inch pieces of fuel tubing instead of the puny brake springs supplied.
- Be sure to space your drive shafts with O-rings as the manual shows.
- An extra 9.2x15x1mm washer in the servo-saver assembly reduces steering slop a bit. An extra rear camber arm can be turned into a front chassis brace. You need one C0113, two C0107A and two C0107D.
- Once everything has been assembled and the gear mesh has been checked, protect the chassis and countersunk screws with Associated* chassis film.

THINGS YOU'LL NEED

- Air filter cleaner and oil—part no. B0302.
- Denatured alcohol in a squirt bottle (an excellent cleaner).
- Starter motor.
- Engine after-run oil.
- Basic hand tools/ball drivers.
- Glue (CA).
- Thread-locking liquid.
- Differential grease or thick silicone fluid.
- Paint.
- Zip-ties.
- A Dremel* tool is helpful.

SETUP TIPS FROM MARK PAVIDIS



At the ROAR 1997 West Coast Gas Off-Road Championships, against an ocean of Kyosho MP-5s, factory driver Mark Pavidis TQ'd with the new Mugen Super Athlete. Aside from a handmade carbon-fiber radio plate and front chassis stiffener, Mark's Super Athlete was amazingly close to stock. Here's Mark's TQ setup sheet, so you'll be able to duplicate his settings on your Super Athlete.

Track surface: bumpy

Engine: Rex
Fuel: O'Donnell* 30%
Glow plug and muffler: NovaRossi*

FRONT END

Damper position: C-1
Damper piston: stock
Damper oil: 35WT
Spring: S (14T)
Spring tension: 15mm
Upper arm position: B-4
Suspension member: 0, 0
Camber angle: 2 degrees negative
Anti-sway bar: yes (diameter is a little smaller than the stock rear swaybar)
Front down stop: 41mm

REAR END

Damper position: C-2
Damper piston: front piston
Damper oil: 35WT
Spring: S (19T)
Spring tension: 15mm
Upper arm position: A-8
Suspension member: 0, +1
Camber angle: 2 degrees negative
Anti-sway bar: stock
Rear down stop: 33mm

Rear lower arm—

Front: 2.4mm
Rear: 2.4mm

Diff-gear oil

Front: 3,000WT
Center: 10,000WT
Rear: 5,000WT

Tires (F/R): Pro-Line* XTR
Front toe: 0 degree

SUPER ATHLETE

tight turning. Cast-metal steering knuckles pivot on upright carriers by means of brass bushings.

• **Rear suspension.** Long rear A-arms feature interchangeable outer pivot blocks. Cool, huh? Inner and outer upper link mounts provide 60 possible combinations with which you can alter roll center. Six possible shock-mounting combinations further enhance adjustability.

Long rear shocks provide 2.1 inches of rear-wheel travel, and the kit comes with a rear torsion bar. Hard-anodized shocks have one-hole pistons and can be tuned

by varying oil thickness, shock angle and spring rate.

• **Powerplant, etc.** Unlike Kyosho, OFNA and Thunder Tiger, Mugen puts the engine on the right side (with the fuel tank), and the battery is on the left. You'll need to get a rear-exhaust .21 engine and a pipe, but the Super Athlete comes with an exhaust header, silicone coupler, spring, pipe mount, flywheel, three-shoe clutch, foam filter, intake elbow and zip-ties. The throttle and quick-adjust brake linkages are sano, and so are the battery holder, anodized servo plate and receiver box.

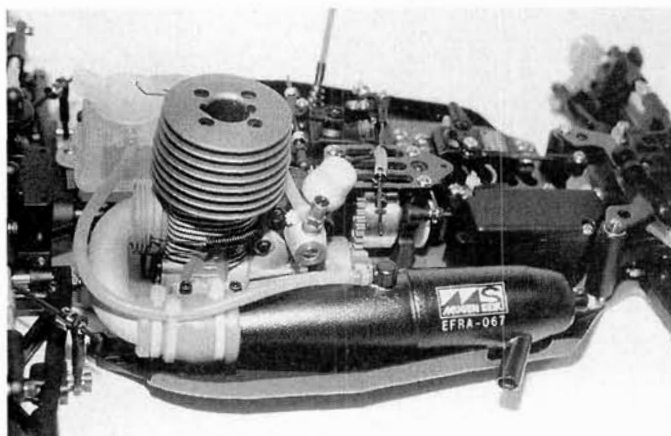
TEST GEAR

- 2-channel radio system with a transmitter and batteries.
- Receiver with 5-cell (6V 600mAh) flat pack.
- Two Futaba S9303 servos with an on/off switch.
- 1.5V glow-plug igniter and spare glow plugs.
- 20- to 30-percent nitro fuel (and squeeze-fill bottle).

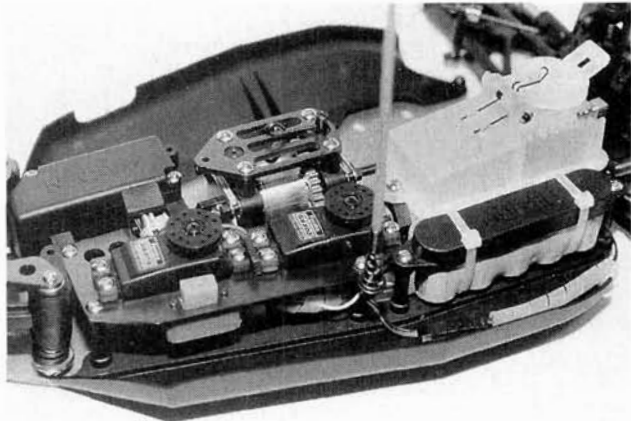
PERFORMANCE

Mugen supplied me with a Beat .21B engine and an EFRA-067 exhaust pipe.

(Continued on page 175)



Engine and pipe mounting are sano, and the control linkages are well-designed. For stronger braking action, use fuel tubing instead of the supplied springs.

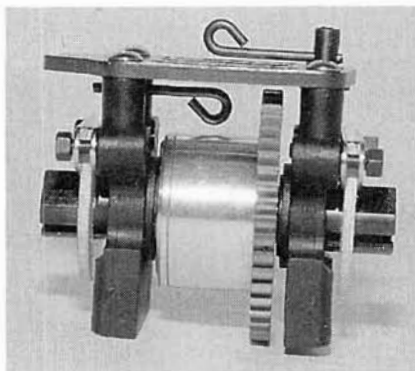


The receiver is protected by a plastic case, and the electrical wiring is routed away from the front drive shaft. The outboard battery location counterbalances the weight of the engine.



Likes

- Full ball bearings.
- Beefy quick-adjust camber arms.
- Excellent anodized shocks with seal covers and preload spacers.
- Excellent manual and setup sheet.
- Metal-case diffs have seals and O-rings for tuning with silicone oil.
- Aluminum wheel hubs accept wheels from many manufacturers.
- Sealed receiver box and sano battery mount.
- Sharp-looking anodized-aluminum parts.
- Rear anti-roll bar and adjustable toe/anti-squat.
- Impressive overall finish and optional parts list.



The center diff features tunable front/rear brake bias and a mount for a chassis brace on the upper plate.



Dislikes

- Bearing slop in rear carriers.
- Flat chassis needs front and rear stiffeners to fight flexing.
- Stock tie-rods require disassembly for toe-in/-out adjustments.
- Stock front shock springs are too soft and too short.
- The flywheel/starter port is a tad small for hand-held starter wheels.

the Competition

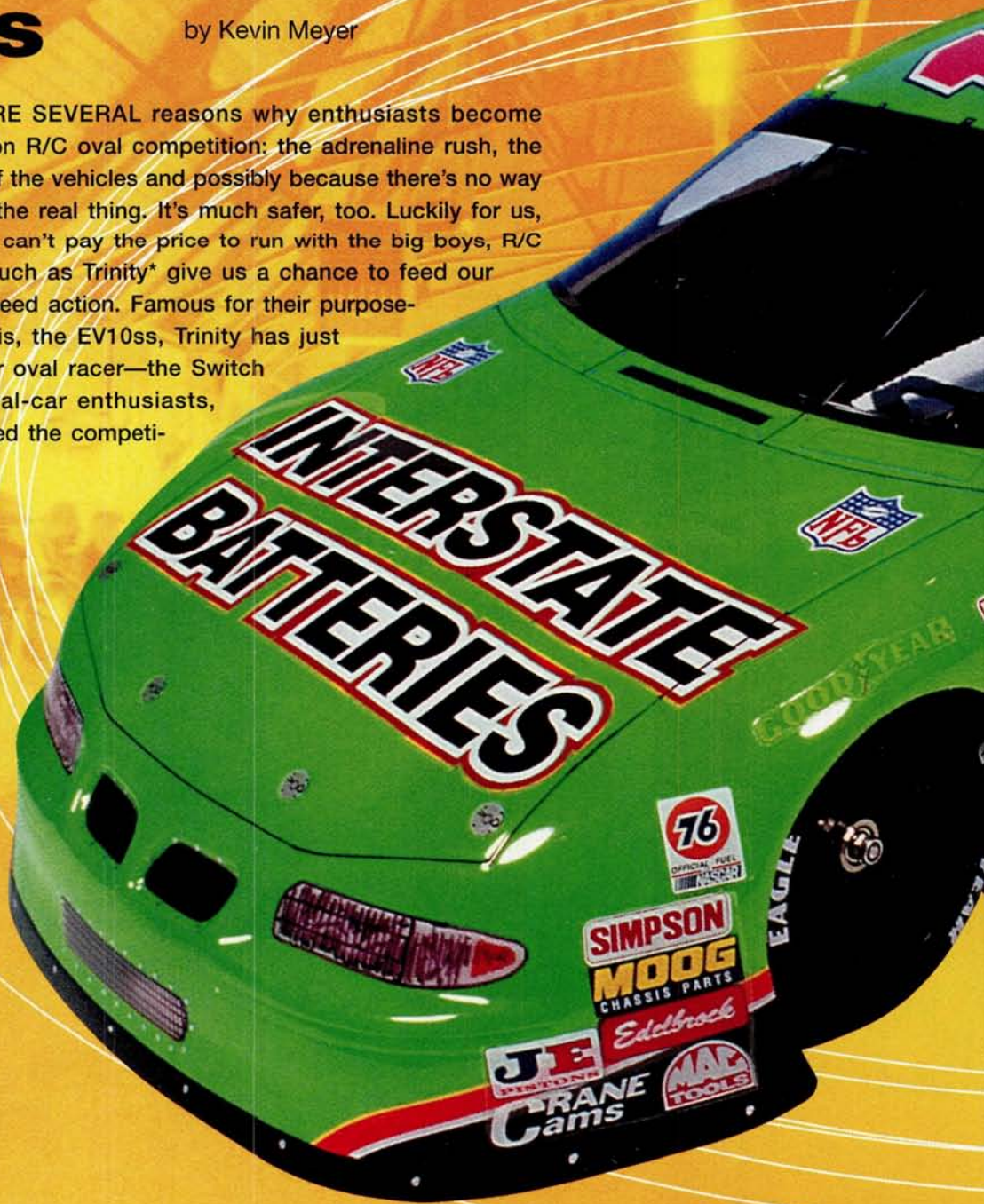
	OFNA Ultra-GT	Mugen Super Athlete	Kyosho MP-5	Flying Point Jet Probe	Thunder Tiger Mirage Pro
Wheelbase	13 in.	12.68 in.	12.625 in.	12.75 in.	12.5 in.
Width	11.75 in.	9.92 in.	11.875 in.	11.75 in.	12.4/12.5 in.
Weight	7 lb., 8 oz.	7 lb., 4 oz.	7 lb., 2 oz.	7 lb., 8.5 oz.	7 lb., 12 oz.
Diff type	Planetary	Planetary	Miter	Planetary	Planetary
Brakes	Dual disk	Dual disk	Dual disk	Dual disk	Dual disk
Exhaust	Tuned pipe	Tuned pipe	Not included	Header & pipe	Header & pipe
Price	\$499	\$749.99	\$699.99	\$595.00	\$499.99
Available at*	\$299	\$500	\$549.99	\$369.99	\$349.99
Issue reviewed	11/95	7/97	12/95	1/95	10/96

*Prices may vary with location.

TRINITY **Switch Blade 10ss**

by Kevin Meyer

THERE ARE SEVERAL reasons why enthusiasts become hooked on R/C oval competition: the adrenaline rush, the realism of the vehicles and possibly because there's no way they can afford the real thing. It's much safer, too. Luckily for us, even though we can't pay the price to run with the big boys, R/C manufacturers such as Trinity* give us a chance to feed our need for high-speed action. Famous for their purpose-built oval chassis, the EV10ss, Trinity has just released another oval racer—the Switch Blade 10SS. Oval-car enthusiasts, get ready to shred the competition!



SCALE 1/10
LIST PRICE \$299

Length overall 13.5 in.
Wheelbase 10.5 in.
Width (F/R) 7.25 / 7.75 in.

CHASSIS

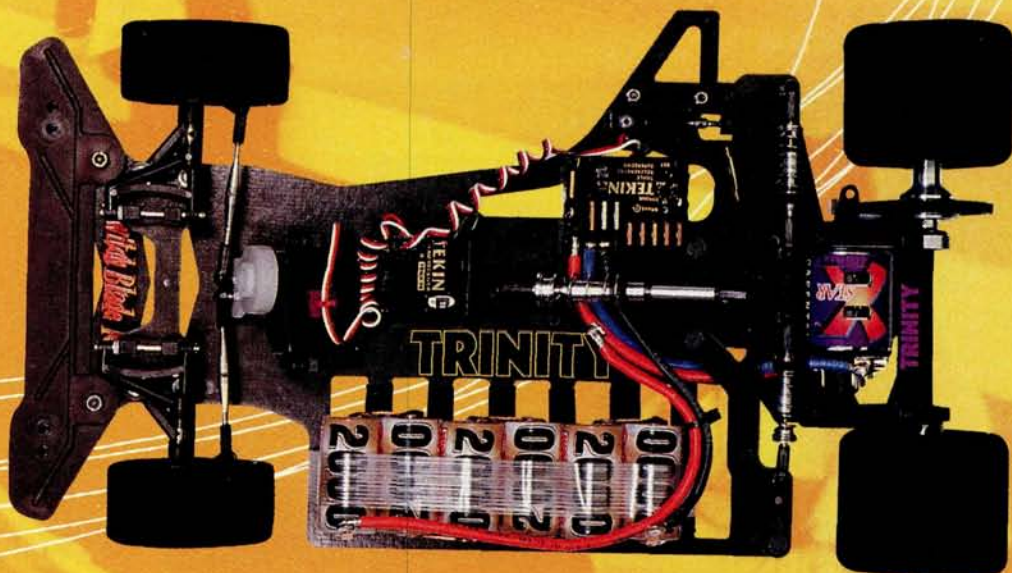
Type Pan-car style
Material Graphite

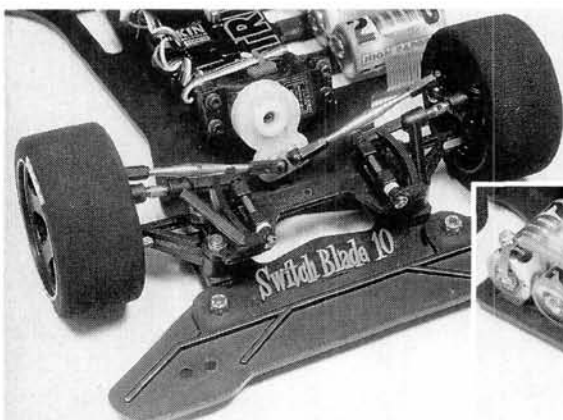
Type	Direct drive
Primary	Pinion/spur
Transmission	Solid axle
Differential(s)	Ball
Bearings/bushings	Bearings

Type—front Fully adjustable reactive
caster, camber, ride height
—rear Triad shocks w/right-side trailing
arm and optional T-plate

ELECTRICS

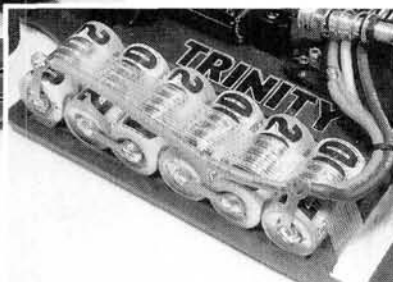
Motor, battery, ESCNot included





Above: Trinity's simplified new Radical Reactive Caster front end is easier to tune than its predecessor on the EV10ss. To adjust caster, alter the position of the washer on the upper control arm—no more turnbuckle linkage to deal with. Roll center is also fully adjustable.

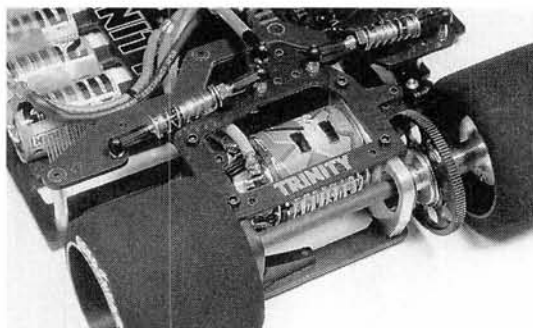
Below: to power the Switch Blade 10SS, I chose Trinity's new 30A 2000mAh VIS-Matched cells—the pack with punch!



THE KIT

First, I looked over the well-illustrated assembly manual. It combines instructions for building the oval and the on-road cars, so you'll have to pay close attention to the text and excellent black-and-white photos. Unfortunately, there are shortcomings. Because of the lead-time necessary to produce the manual, some of the parts shown are prototypes and were changed after the photos had been taken.

In the rear, you'll find a graphite axle and a graphite composite Zero Friction Super Spur (120-tooth); you have the choice of running either the standard trailing-link rear-pod setup, or the more usual T-bar setup (which is also included with the kit). Note the Triad rear-shock damping system.



Out of the box, the Switch Blade 10SS is a complete racer. The car is based on a nicely carved out 0.100-inch-thick super stiff graphite-composite chassis plate with seven extra-wide battery slots. When you run only 6 cells, the seven slots allow you the tuning option of altering the car's weight bias by moving the cells forward or rearward. The slots' width is also useful for tuning: for maximum rear bite, place the cells in the rear and more toward the car's centerline. To carry more speed

THINGS YOU'LL NEED

- Servo-saver.
- 2-channel radio system w/small servo (unless you want to drill new mounting holes).
- ESC.
- Motor.
- 64-pitch pinion gear.
- 6-cell battery pack.
- Charger.
- Superspeedway body and Lexan paint.

through the middle of corners, place the cells to the rear and farther to the left. For even more steering, move the batteries one slot farther forward.

Up front, you'll find Trinity's new Radical Reactive Caster suspension system. This has a fully adjustable roll center so you can independently adjust the camber gain from left to right side. This allows you to adjust how aggressively you want the car to turn in. The new front end was designed to be much easier to tune than its predecessor. Caster can be altered by adjusting the positions of the washers on the upper control arm. Move the washers to the front and you get close to zero caster. Put one in the front and one in the rear, and the car has 2 degrees of caster. Place both washers toward the rear, and the front end now has 4 to 5 degrees of caster. In addition, the graphite upper suspension brace makes the front end extremely rigid, and that means a more predictable, more tunable car.

The SB10SS kit includes both the tri-shock trailing-link suspension system and a T-bar conversion, and that allows you to create the ideal setup for any track imaginable. The trailing links plant the rear tires and give maximum rear traction. On flat tracks, this enables you to make the



Building & Setup Tips

- Before starting assembly, I wet-sanded the exposed edges of the graphite parts with 400-grit sandpaper and then sealed them with CA.
- To make the pivot-ball mounts fit smoothly into the T-bar, use a 3/8-inch or tapered reamer to enlarge the hole slightly. You could also use a sharp hobby knife; cut carefully and smoothly to avoid gouging the graphite. To avoid making the hole too large, trial-fit the parts often.
- Attach all the shock-mount ball studs before you attach the plate to the rear-pod bulkheads. If you don't, it will be difficult to install the ball studs, and clearance will be tight after the pod has been assembled.
- I found it easier to install the axle bearings in the plastic inserts and then install them in the pod bulkheads.

- The diff assembly includes a 64-pitch spur gear mounted on a graphite axle with a full set of bearings. If this is your first pan car, enlist the help of someone who has experience. In the assembly guide, this step could be made clearer by adding a picture of the sequence in which the parts go on the axle.
- I relieved the holes in the caster blocks to allow the caster pins to slide in easily.
- To prevent my packs from sliding, I use gripper tape on the battery slots, but if you use heavy-duty strapping tape, they should stay put.
- See the useful tuning tips in the manual, and be sure to take it with you to the track!

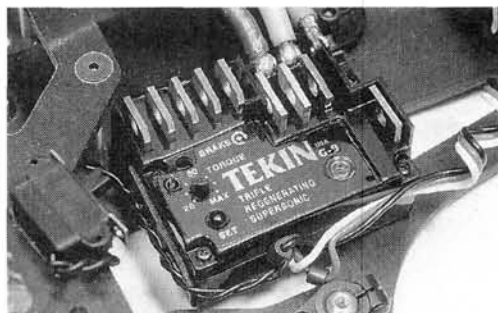
FACTORY OPTIONS

- Progressive springs—part no. EV0104.
- Constant-rate springs—EV0132.
- Purple aluminum ball studs—EV0047P.
- Purple "more clearance" pod plates—EV0108.
- Purple aluminum diff hub—EV0121.
- Purple micro shock set—EV0145.
- Light left clamping hub—EV4050.
- Purple 8-32 nuts—EV4054.
- Purple large volume shock—EV4058.
- Switch Blade 10SS purple screw kit—SB5076.
- Switch Blade 10SS purple aluminum lower suspension arms—SB5077.
- Purple 4-40 mini locknuts—EV0143.
- Steel "Ultra Bar" T-bars—SB5230 (wide); SB5231 (narrow).

car turn much more aggressively without the back end becoming loose. The trailing-link setup is also a big advantage on bumpy tracks because it allows the rear suspension to absorb the bumps, and that makes the car more efficient and more controllable. On the other hand, the T-bar setup (0.074 thick) can be an advantage on banked tracks on which the car tends to bottom out in the corners because you can't get the trailing-link setup stiff enough. The T-bar's progressive action lets you run an initially soft rear suspension that becomes stiffer as the suspension is compressed. Trinity also offers a steel T-bar which retains its memory and does not tweak (available in narrow and wide versions).

There are two sets of mounting holes for the rear pod—another new feature. You can run the pod in line with the chassis centerline or offset 0.300 inch to the left. Offsetting it to the left will make the car drive off the corner more (or tighten up coming off). This will allow you to make it turn in more aggressively without getting loose coming off the corner.

The ultralight graphite rear axle is coupled with a standard, silky-smooth ball differential and a full set of Jaco* foams (Green compound). Also included are one of Trinity's new Zero Friction Super Spur graphite 120-tooth spur gears, and aluminum rear hubs and steering turnbuckles. Hey, I told you it was a hardcore racer



To get the power to the ground, I installed one of Tekin's newest ESCs, the ultra-smooth G-9, which I've found very reliable.

right out of the box!

Putting this kit together requires two or three evenings of serious assembly. I worked on the car over five evenings (can't quit my day job!).

I never mount my NASCAR bodies before taking photos because the mount-

Likes

- Ultra-light high-quality graphite parts.
- Highly tunable.
- Front suspension springs are easy to change.
- Adjustable wheelbase.
- Triad shock setup and T-bar conversion included.
- Pre-drilled servo-mounting holes.
- Manual contains useful tuning tips.

Dislikes

- E-clips used on front end.
- Manual was a little confusing in some areas.

other cars, I had found a setup I was comfortable with, so before running the Switch Blade, I did some front-tire swap-

The Competition

	Hyperdrive/PTI SSE	Bolink LTO Extreme	Trinity Switchblade	Associated RC10L20	HPI Road Star 10G0
Width (in., F/R)	7.2/7.85	7.8	7.25/7.75	8	7.5/7.75
Weight	2 lb., 10.5 oz.	2 lb., 10 oz.	2 lb., 10 oz.	2 lb., 13 oz.	2 lb., 10 oz.
Diff Type	Ball	Ball	Ball	Ball	Ball
Chassis	Graphite	Graphite	Graphite	Graphite	Graphite
List price	\$285.95	\$239.95	\$299.99	\$260	\$335
Available at*	NA	\$179.99	\$189.99	NA	\$199.99
Reviewed in	Not reviewed	Not reviewed	7/97	5/97	Not reviewed

*Prices may vary with location.

ing posts and antenna really detract from a car's scale appearance. When I received this work of wonder from Scott Bich (of Bich'n Bodies*), I knew there was no way I'd ever touch it with anything but a soft rag. Scott combined Realistic Racing Colors* paint and Slix* decals on the Protoform '97 Pontiac.

TEST GEAR

- New Futaba* Magnum Jr.
- Futaba S132H servo.
- Tekin* G-9 ESC and Mini Pro receiver.
- Trinity 30A VIS EX-Tra-Matched 2000mAh cells.
- Trinity Midnight and X-Star stock motors.

PERFORMANCE

With the assembly complete and my radio system installed, I packed up my gear and headed for the local carpet track, Queen City R/C Raceway in Wheatridge, CO. The race program consists of four, 4-minute qualifiers and a main. With

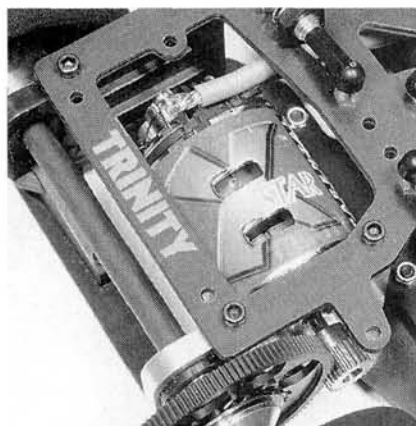
ping (I changed to Blue Jaco foams) and spring changing: the 10SS comes with .022 springs; I switched to Associated springs—a .014 on the left and a .018 on the right. (Trinity also offers progressive and constant spring kits, but I didn't have any handy.) I secured the battery pack more toward the rear and centered in the slots.

The first few practice laps revealed slight understeering (push), so the car came back to the pits for a front spring change. I kept the .018

spring on the right but swapped the left front spring for a .016 spring. I changed the springs one at a time so I'd be able to see the effect of each on the car. After running a few packs, I went back to the standard Green foams in the front but kept the springs that I had the car set up with. With a few other minor tweaks, by the end of the night, I had the car handling to my liking. The kit's Greens seem to be good to start with (at my track anyway).



At the front and rear, you'll find Jaco Green-compound foam tires.



I race on a long oval course where we mostly run stock motors. To get the ultimate speed, I opted for one of Trinity's newest stockers, the X-Star. It provides plenty of top-end power.

(Continued on page 171)

thrash
TEST

1/4 scale gas

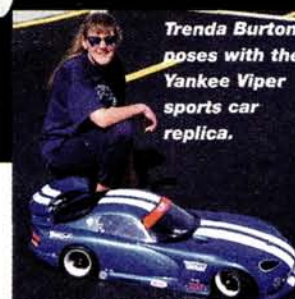
YANKEE Dodge 1/4-scale Viper

by RICK EYRICH

"Unique" would be a good word to describe the Dodge Viper body on the Yankee 1/4-scale R/C car. CEC's Danny Fine painted and detailed the Lexan shell in the classic blue/white scheme of the full-size car.



The Viper was the pace car for the 1997 Icebreaker quarterscale race at Burton's R/C Raceway.



Trena Burton poses with the Yankee Viper sports car replica.

I DOUBT THAT many of us can envision the stress that R/C car designers sometimes have to endure. Imagine trying to reduce a full-size vehicle's body shape, window outlines, cowl and headlights, contours and overall scale appearance and trying to make the R/C version perform like it!

Now consider attempting this feat with the Dodge Viper sports car! Not only must you recreate the car's stunning appearance, but you must also duplicate its tire-smoking 450hp!

Fear not, you "true to scale all the way" R/C'ers; Yankee's* 1/4-scale replica of the Mopar muscle car has both the look and the power you'd expect in an R/C sports car.

This large-scale Viper was definitely laid out by a savvy design crew who knew what most R/C folks want—contours, looks and race-winning technology in one package.

MASSIVE

KIT FEATURES

Outwardly, the Viper's chassis looks much like one on an Indy-type car. The slim, plastic-coated, aluminum frame plate relies on composite/aluminum uprights to mount the suspension components on each end of the chassis. Overall, this Yankee vehicle looks fast and light from end to end.

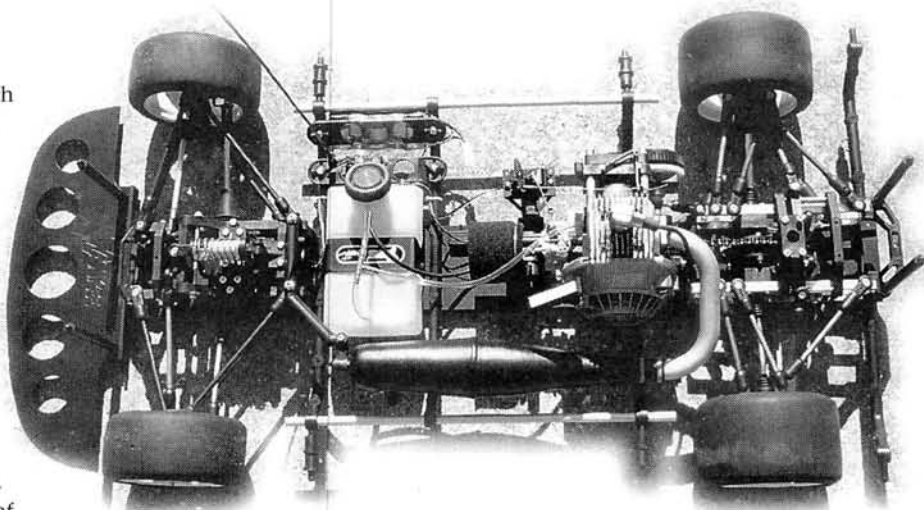
The front end uses flexible, multi-piece A-arms and a pivoting pushrod/shock to manage the humps and bumps. Captive wheel axles spin on double ball bearings, and a large front bumper protects the whole shebang.

Yankee's Turn Force servo unit handles the car's steering duty via a pair of sealed pushrods. This single onboard servo was truly designed for large-scale R/C vehicles, as it will turn the big wheels with the car sitting still. Even in pairs, few servos can match this power.

Moving rearward, you'll find a Yankee F-7 22cc 2-stroke attached to the aluminum chassis. The F-7 engine comes stock from Yankee with case-induction, Walbro carb, tuned exhaust and a Teflon™-coated clutch. A 16-ounce fuel tank supplies the gas/oil mixture, and a sock-type foam air filter is tie-wrapped to the carb air inlet.

The clutch drive transfers engine power to the rear wheels via a four-part drive train. This clutch spins the adjustable twin gearing cogs which, in turn, spin a jackshaft. The shaft then rotates a 6mm chain, and this activates the sealed gear diff on the rear axle. Dogbones turn the rear wheels, and the stopping duties are handled by a fiberglass disk mounted on the clutch section.

The Viper wheels have wraparound tires that are available in three rear compounds and two front compounds. Blue



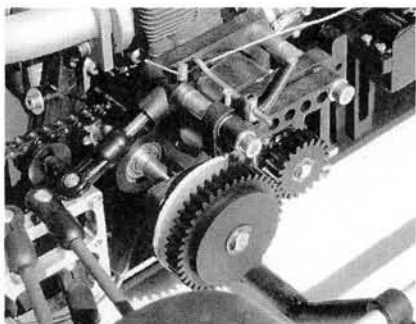
Based on a coated aluminum chassis plate, each end of the frame uses both aluminum/composite suspension parts. The simple, effective layout of the engine, drive and radio gear makes the car easy to maintain and drive.

foam inserts support the tires on the two-piece rims, and CEC also stocks Goodyear rubber that will fit on most Yankee R/C vehicles.

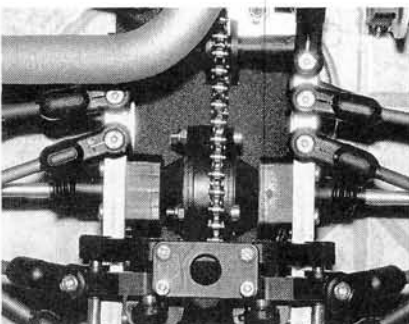
CEC's Danny Fine painted, fitted and detailed the multi-piece Lexan Viper shell in the classic blue/white stripe motif. Ten posts and clips hold the Viper body on the frame, so it won't go anywhere without the shell in place!

TEST GEAR

CEC sent the Dodge with the 3PDF-FM variant of Futaba's new Magnum Racer radio. This 75-band FM system uses an S3003 throttle/brake servo and the Yankee steering servo for control. A 5-cell Sanyo SCR1400 pack supplies DC current for the radio system. Hardcore racers might want to beef up braking power by using a throttle/brake servo with more torque like Futaba's S9303 or S9304.



A Teflon™ clutch delivers power to the gearing set and, in turn, transfers energy via a jackshaft/chain to the rear diff unit. A fiberglass disk-brake setup takes care of the stopping chores and is easily adjustable by means of the transmitter trim knob.



A 6mm-wide chain runs between the center jackshaft and rear axle gear diff. Steel dogbones connect the diff to the rear wheels, and everything turns on sealed ball bearings.

Specifications

SCALE 1/4
LIST PRICE \$1,995

DIMENSIONS

Overall length 44.5 in.
Wheelbase 25.14 in.
Width (F/R) 20.25 in.

WEIGHT (gross, RTR) 26.8 lb.

CHASSIS

Type Lower narrow plate
Material Coated aluminum

DRIVE TRAIN

Type Teflon™ clutch/gears/
jackshaft/diff
Primary Clutch bell to chain
Transmission Steel sealed
dogbones/axles
Differential(s) Sealed planetary
gear diff
Slipper clutch None
Bearings/bushings Bearings

SUSPENSION

Type—front Double wishbone arms
—rear Fulcrum arm/wishbones
Damping Oil-filled shocks:
one front, two rear

WHEELS (F/R) Molded
5-spoke (two-piece)

TIRES (F/R) Rubber wraparound
w/foam inner liners*

POWERPLANT

Engine Yankee F-7 25cc, 2.25hp,
2-stroke case induction
Pipe Header and tuned
exhaust w/coupler
Carb WT butterfly-valve Walbro

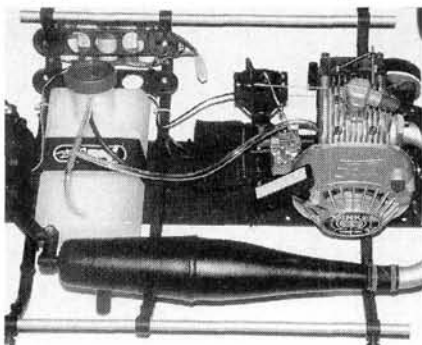
*Three compounds for rear; two for front tires

OPAR MISSILE

YANKEE DODGE VIPER

PERFORMANCE

The straight-from-the-box Viper's on-track testing began on an oval, asphalt track—Burton's RC Raceway in Lakeland, FL. The Yankee had the large-scale oval down pat. It took about a half tank of fuel to set the car's Walbro carb, but once it had been adjusted, the Viper looked right at home on the slightly banked oval. No other suspension

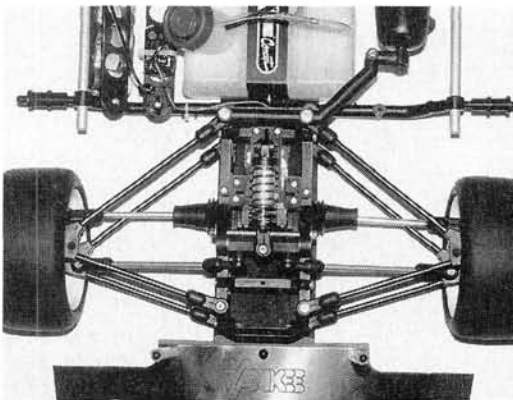


tweaking was needed during the oval portion of the testing, so the Dodge is circle-track-ready from the factory.

During the first fuel stop, I quickly inspected the chassis, and only two areas required attention: the tire edges and the onboard radio battery pack. The inner tire/rim area on the right tires was beginning to loosen, so both got a quick bead of thin CA.

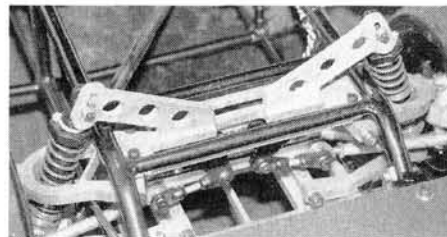
To hold the 5-cell Ni-Cd battery together and in place, it is shrink-wrapped in thick tubing at the factory. The clear wrap showed signs of stretching, so two heavy-duty tie-wraps went around the Sanyos and battery mount to ensure that they stayed tight on the chassis.

(Continued on page 173)



Left: the Indy/F1-style suspension is evident on the front end. A single in-line shock controls the damping while flexible dual wishbones move the front wheels over the bumps.

Left: a high-output, tuned exhaust system works with the F-7 engine to provide ample horsepower for the rear wheels. The dual "outriggers" on either side of the frame plate double as pipe/body/radio mounting points.



Below: the twin, rear, in-board shocks work off a pivoting lever to the rear suspension arms. The machined-aluminum uprights are a recent update to the Viper-class chassis and give the vehicle extra strength and support in the rear drive/A-arm area.

Likes

- Came assembled from CEC—gas and go!
- Unique body design draws crowds.
- Race-ready look of chassis and engine.

Dislikes

- Battery cells are too close to the metal body post and might short out cells.
- Body scrapes even small bumps in asphalt.

THINGS YOU'LL NEED

- Fuel container, 2-stroke oil and high-test gasoline.
- Battery charger.
- Chain lube.

FACTORY OPTIONS

- 2-speed transmission—part no. 80450000.
- Front disk brakes—80236000.
- Goodyear tires.
- Custom paint and graphics work.



Building & Setup

The Yankee Viper reviewed here came RTR from CEC, so I'll describe the few tweaks I made during the testing.

- I noticed some leakage around the coupler joint between the exhaust header and tuned pipe, so I replaced the stock coupler joint with a 1/8-inch length of Aerotrend's* no. 1057 coupling hose—end of leak.
- I used some 1/8-inch-thick stick-on foam pad to prevent the on-board Ni-Cd pack from shorting out on the body post. Then I ran two heavy-duty tie-wraps around the battery and mount to hold them securely.
- You'll need to lube the short drive chain regularly to maintain its performance and durability. Use a light oil, and apply it between the side drive plates, not on the rollers. Wipe any excess off with a rag.
- The fuel-tank-cap opening is directly above the radio receiver and battery-pack area. Use a funnel to avoid spilling gas on the radio gear!
- Before you run the Viper, I suggest that you run a bead of thin CA around each of the car's tire/rim junctions. It will keep the wraparound tires in place no matter how hard you snap-turn the vehicle.

Keep Your Fuel Fresh

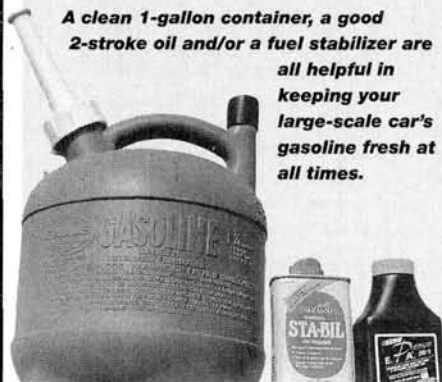
Fact: all the 2-stroke engine fuels used in large-scale R/C vehicles (including the Viper) have one thing in common: they don't improve with age! The reason for this is simple. Adding any oil to any gasoline reduces the gas's octane rating, and this in turn shortens its already limited shelf life!

So, to ensure that your R/C car is easy to start and runs smoothly, follow these guidelines. First, try not to mix more gas and oil than you'll use in seven to 10 days, tops. Second, use only a 1-gallon container, and store it in a cool, dry area. And third, be sure to shake the container before you refill the car's fuel tank. The idea here is to reduce any possibility that the fuel mixture will go stale or become contaminated or that the oil will separate from the gas!

Use brand-name gas (Texaco, Shell, etc.), a good air-cooled engine and single-ratio oil. If you must store fuel, add a fuel stabilizer to reduce the chances of the mixture becoming stale.

Think of it this way: your car's engine would relish taking in old, stale fuel about as much as you'd like swallowing a mouthful of six-month-old buttermilk or apple juice! Sure, it can be done, but it ain't gonna be enjoyable for either party!

A clean 1-gallon container, a good 2-stroke oil and/or a fuel stabilizer are all helpful in keeping your large-scale car's gasoline fresh at all times.



**Big. Colossal.
Enormous. Giant.
Gigantic. Huge.
Humongous. Immense.
Intense. Imposing.
Large. Mammoth.
Massive. Mighty.
Monstrous.
Monumental.
Powerful. Titanic.
Tremendous.**

Oh yeah, it's back, and it's as bad as ever. Welcome to Project Big Truck, Part 3.

THE MONSTER RETURNS

I've learned a lot since I completed my first "big truck" project (July '94 issue) and even since I revamped it ("Project Big Truck, Part 2," April '95). So what did I use this time around to make this beast? How did I make it even bigger and better? Well, I incorporated some of the items I used on the past two projects as well as a few new ones. Let's take a look.

PROJECT BIG TRUCK III

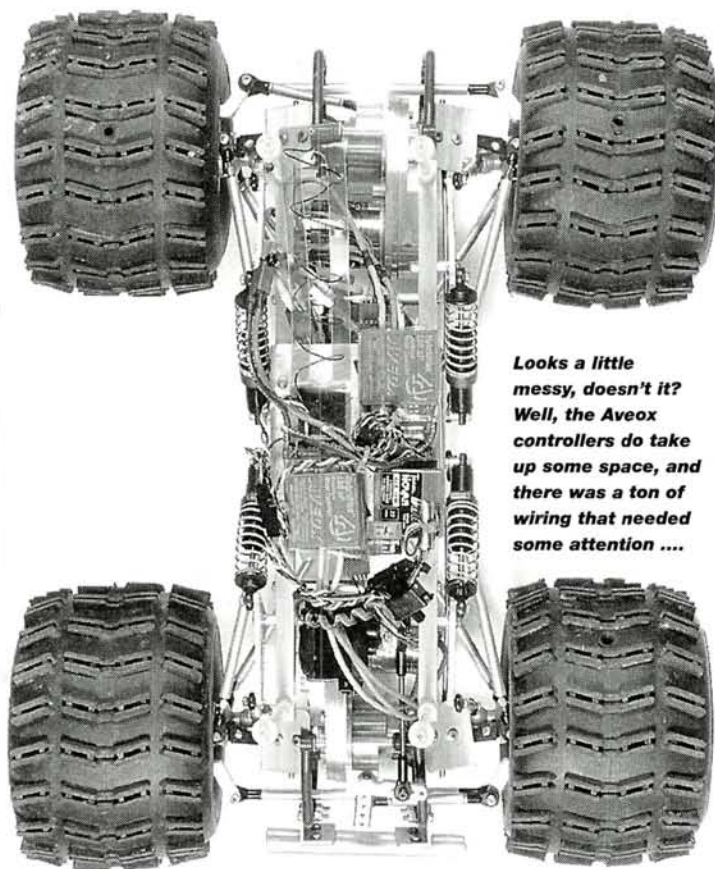




BIGGER
stronger
faster

by John Howell

PROJECT BIG TRUCK



Looks a little messy, doesn't it? Well, the Aveox controllers do take up some space, and there was a ton of wiring that needed some attention

CHASSIS

I started with the ESP* Clodzilla IV Full Race Package. The package's backbone is the new aluminum Clodzilla IV Super-Lite race chassis. It's much smaller, narrower and lighter than its predecessors. The battery is mounted lengthwise in the bottom of the chassis to help lower the center of gravity, which improves handling.

Also included with the Race Package is the all-new Clodzilla IV Cantilever Suspension Kit. It improves handling by lowering the truck's ride height while maintaining an incredible amount of suspension travel. The cantilever arms pivot on precise ball bearings for ultra-smooth suspension action.

To help control chassis roll during cornering, ESP designed an anti-sway bar kit. I mounted it on PBT3 to help keep it stable while taking corners under full acceleration. The kit consists of spring-steel anti-sway bars, aluminum slider brackets and chassis mounts with rubber bushings.

Complementing the chassis are ESP's long wheelbase multi-link suspension kit, heavy-duty steering rods with rod ends, gearbox cover/steering servo plate and their all-new ball-bearing-supported aluminum steering link (it replaces the stock unit that sits in the front of the gearbox).

THE ULTIMATE PIT SP



When you pull up the Team Serpent Network web site you pull into gas racing's ultimate pit space. Browse the on-line version of our 80-page, 200-photo Tech Book – a virtual gas car bible that puts 20 years of tuning know-how at your fingertips. Join the Cyber-Pit, a unique interactive web page where racers from around the world share tech information. Download our exclusive START datalogging software...for free. Or read the latest tuning tips in columns by the current World T.Q., the ROAR Champion, and other experts. TSN – get it dialed up, and get your car dialed in.



MOTORS

One of the things I've learned about trucks of this nature is that you don't want to run motors with silly amounts of rpm and no torque. In this application, torque is what it's all about. The 19-turn Yokomo*-based motors I used in the last project worked admirably, but this time around, I was looking for something a little different. Luckily for me, associate editor George Gonzalez came up with a brilliant plan: he had recently been on the phone with the people from Aveox* (regular *Car Action* readers probably know by now that Aveox motors are the choice of champions in the Insane Speed Run velodrome racing cars) and was told that they were in the process of designing a new motor application for R/C cars.

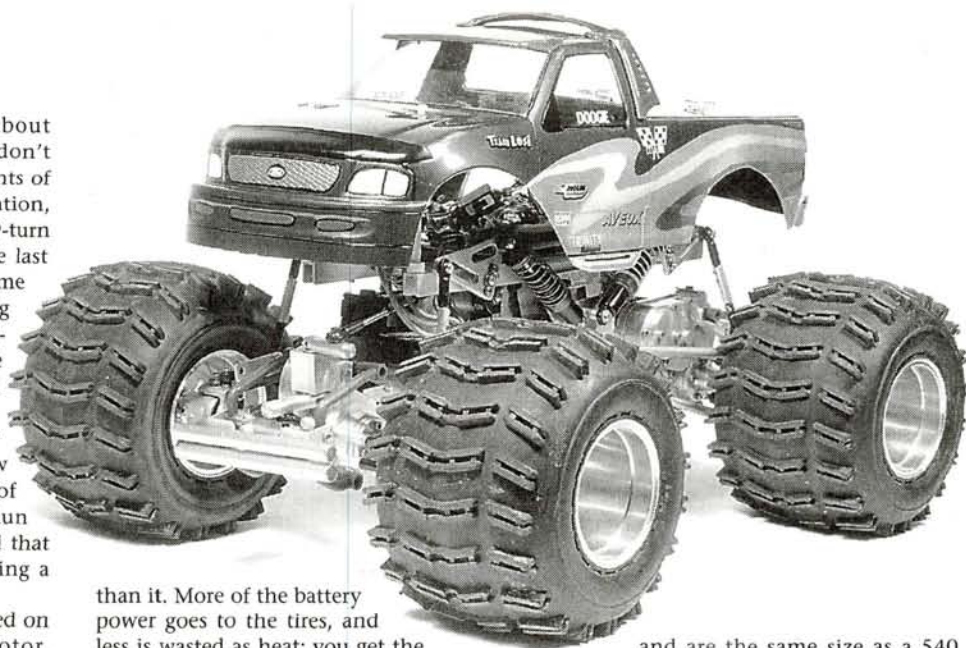
The new motor—the RC7—is based on the Aveox 1409 2Y brushless motor. Brushless motors have been popular in model airplane applications for years; they have no brushes or commutators. The only moving parts are a center shaft (to which a permanent multi-pole magnet is attached) and two ball bearings (one on each end of the pole). The motor comes with its own speed-control system.

The RC7 is slightly larger than a standard 540-size motor and more efficient

than it. More of the battery power goes to the tires, and less is wasted as heat; you get the same performance over countless runs (no comm or brushes to wear out), and it produces roughly three times as much power as a 540. The disadvantages are that it is slightly bulkier, and it takes an awful lot of voltage to run this sucker. Brakes were not variable either.

The all-new Aveox RC7 motors were designed specifically for R/C cars. They run on a lower voltage (as few as 6 cells)

and are the same size as a 540 motor. Variable rpm as well as brakes are a new plus, and they include new speed-control systems that feature a simplified one-button setup. And they are powerful! Because this is a dual-motor application, I received two of the Aveox motors (one set up for reverse rotation) and two speed control systems. I used the Robinson Racing* steel, 32-pitch, 12-tooth pinions that I used the last time.



CE IS IN CYBERSPACE



www.serpent.nl

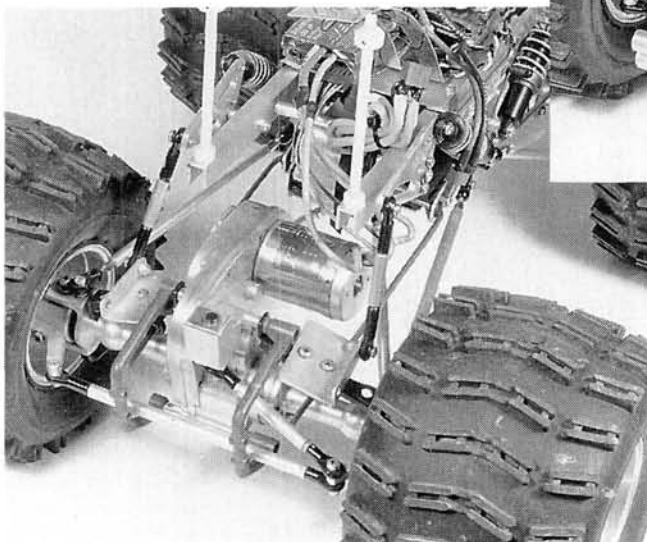
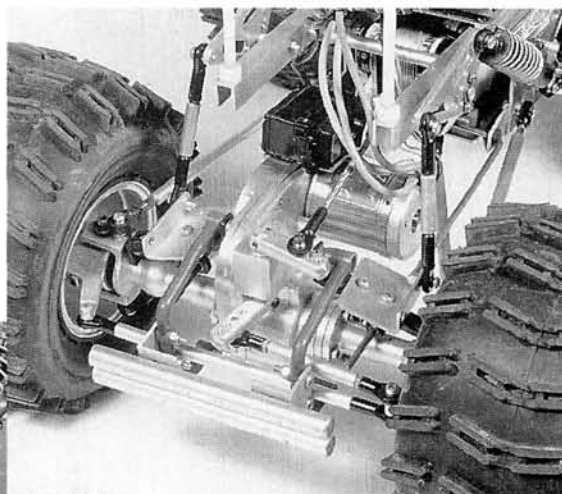
Serpent
EXCITEMENT IN THE FAST LANE

PROJECT BIG TRUCK

Right: is this the front or back? Actually, it's the front end. To help turn the huge tires, I used ESP's all-new aluminum steering assembly in the front of the JPS aluminum gearbox.

Below: I locked down the four-wheel steering system because I didn't want the truck to get too squirrely at high speeds. I'm glad I did; this truck is wicked fast!

Below right: powerful, torquey, fast; take two Aveox RC7 car motors and call Dr. Big Truck in the morning.



BATTERIES

Last time around, I used a 9-cell Trinity* SCRC Pro pack, which provided plenty of power. Because I planned to use two Aveox motors, I would need a minimum of 12 cells (6 per motor). Since I wanted this beast to have some get-up-and-go, I opted to run some of Trinity's killer 30A VIS-matched 1700 SCRCs. These cells pack a wallop!

ELECTRONICS

I had decided to run the microprocessor-controlled Aveox motors, so I needed to use their speed-control system, and because I was running two motors, I needed two separate controllers. That didn't leave me with much room to spare on the top plate of the chassis to mount everything (one Aveox controller takes up roughly as much space as a credit card). I chose a Novak NER-3FM receiver, which nestled quite nicely between the two space-consuming Aveox units.

To steer the beast, I picked a JR* Remote Control 4735 servo (90 ounces of torque). I added a large Kimbrough* servo-saver to the steering assembly so I wouldn't blow up the servo (without a servo-saver, those large, heavy tires can wreak havoc on a servo). On Big Truck II, I tried ESP's dual-steering-servo conversion kit; I liked it at first, but after running the truck for a while, I found that it just had too much steering for

my taste. The single-steering-servo setup suits my taste much better. To control the truck, I turned to my trusty Airtronics* Caliber 3Ps.

WHEELS AND TIRES

I know the JPS* aluminum wheel/Pro-Line* Giant Trac AT-56 Clod Buster tire combo is excellent, so why mess with success? The Pro-Line tires effortlessly spit out mud, rocks, people and sand. The tread really grips the dirt well, and they help the truck handle gnarly hill-climbs with ease (one of my favorite past-times with this truck). And what else can I say about the JPS wheels? They're works of art.

MISCELLANEOUS

Remember what I just said about the JPS wheels? Let's add their aluminum gearboxes and axle tubes to that list. They are simply awesome! Now, I know that they aren't absolutely crucial in a truck of this nature's build-up, but they really are exquisite. They help add to the number of "oohs" and "aahs" this truck gets the first time people see it. Besides being pretty, they sure are beefy: they're just about bulletproof, too. To protect the front gearbox in case of a crash, I used an ESP aluminum twin-tube lower bumper.

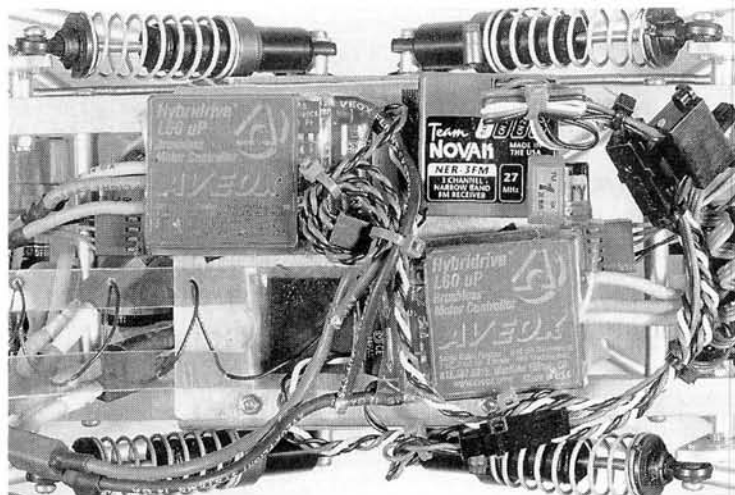
I was going to change the shocks, but the Team Losi* Hard-Body hard-anodized shocks have worked flawlessly, so why

change them? I took them apart, rebuilt them, then filled them with 40WT Trinity silicone oil.

Topping off the truck is a Parma* Bigfoot 1/10-scale body. It looks awesome and fits the chassis well, and it includes all sorts of Lexan goodies such as wings and visors to help sport it out. You can deck it out and detail it from mild to wild. Contributing author Greg Vogel sprayed the body so it would look real purty (everyone who knows me can testify that I'm no da Vinci). I also used one of Parma's inboard antenna-mounting units so I wouldn't have to poke any holes in this cool body.

TIME TO GET THE BEAST ROLLING

The toughest part about getting the truck up and running was installing and setting up the motors and speed controls. After tinkering around with them for a while, George and I were ready to match the motors and controllers to my 3Ps. We had two 6-cell battery packs (one for each motor and controller), and after we had matched one of the motors to the radio, I pulled back the throttle as George held the truck off his work table and braced himself so that the motor's torque wouldn't kick the truck out of his hand. In reality, the breeze coming from the open window nearby had a better chance of blowing it out of his hand. Man, was it slow! We had no idea what

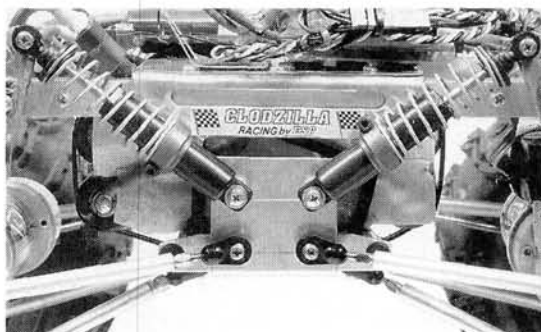
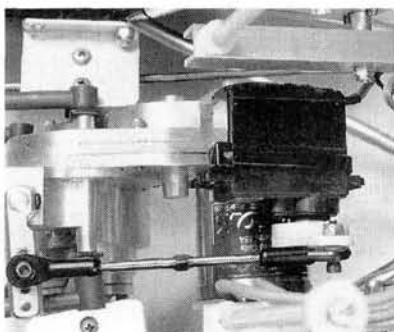


Left: a closer inspection of upper radio tray reveals the ... uh ... intricate ... wiring job. What a mess! I have to say, though, that the work was well worth the effort. This truck shreds! I can rant and rave about the Aveox system until I'm blue in the face; it's simply awesome.



Right: there is no other tire for Big Truck than Pro-Line's Giant Trac AT-56 Clod Buster. If you plan to build a truck like this, or any other "big truck," invest in a set of these. You won't be disappointed.

To steer Project Big Truck III, I used an Airtronics 94157. It nestled quite nicely on an ESP servo-mounting plate placed on top of the JPS gearbox.



The backbone of it all—ESP's new Clodzilla IV racing chassis kit. It has just about everything you need to turn your mild-mannered Clod into a king of the hill-type monster.

we were doing wrong.

Aveox's Dave Palumbo informed us that we had set the controller wrong, and if we ran it that way, "It wouldn't be very fast, but it would run for hours." With a Futaba* Y-harness, we wired the two controllers to work as one unit, spliced their two battery connections together and then ran the two packs in series instead of individually. After we had set it up correctly, we tried it again. This time, the truck had some serious yank! George had to hold on tight as I goosed the throttle. It was time to tear it up outside.

PERFORMANCE

You haven't lived until you've seen a monster truck tear it up—especially one that is as fast and as powerful as this one. It truly is a sight to see. Though the truck gets plenty of attention when it's sitting still, it gets even more when it's tearing up the dirt. Here's what I learned with PBT3:

- The single most important thing is to limit steering—in every way. What do I mean by that? Well, monster trucks like this don't like to turn very fast—especially at speed. Toss in a ton of horsepower, and you have "rollover city." I was glad that I had decided to go back to the single steering servo. If you decide to build a truck like this, you don't plan to run hot motors and you want more steering, I suggest that you try the dual-servo-

conversion kit. If you plan to stuff some hot motors into this beast, stick with the single-steering-servo setup. It makes the truck much easier to drive. Also, be careful when you drive a truck like this. When it's going fast in a straight line, don't yank the wheel hard to the left or right and expect it to handle like a Ferrari; you'll end up watching it roll over and over and over

- This truck is a nasty hill-climber; I love it. When we pitted the stock Tamiya Clod Buster head to head against the Kyosho USA-1 a while back, one of the tests was a hill-climb to see which vehicle would rule. Both were able to make it up and down, but it wasn't easy for them. Granted, they didn't have Aveox motors or 12 cells, but I honestly believe that a similarly set up PBT3 still would have smoked them. PBT3's suspension system combined with the Team Losi shocks is 10 times better than either of the stock monster trucks' suspension systems. It easily scrambled up and down the hill's irregular surface without getting into trouble.

- It jumps better than the previous two trucks I built. The chassis design with the new cantilever suspension system deserves all the credit here. The lower center of gravity helps prevent the truck from bouncing all over the place after landings.

- I altered the spring preload on the shocks to increase tension. I noticed that occasionally, when the truck came off a jump, one of the shock-spring retainers popped off. I realized that I had set the spring preload too loose, and after I had firmed it up, the truck actually responded much better over rough terrain.

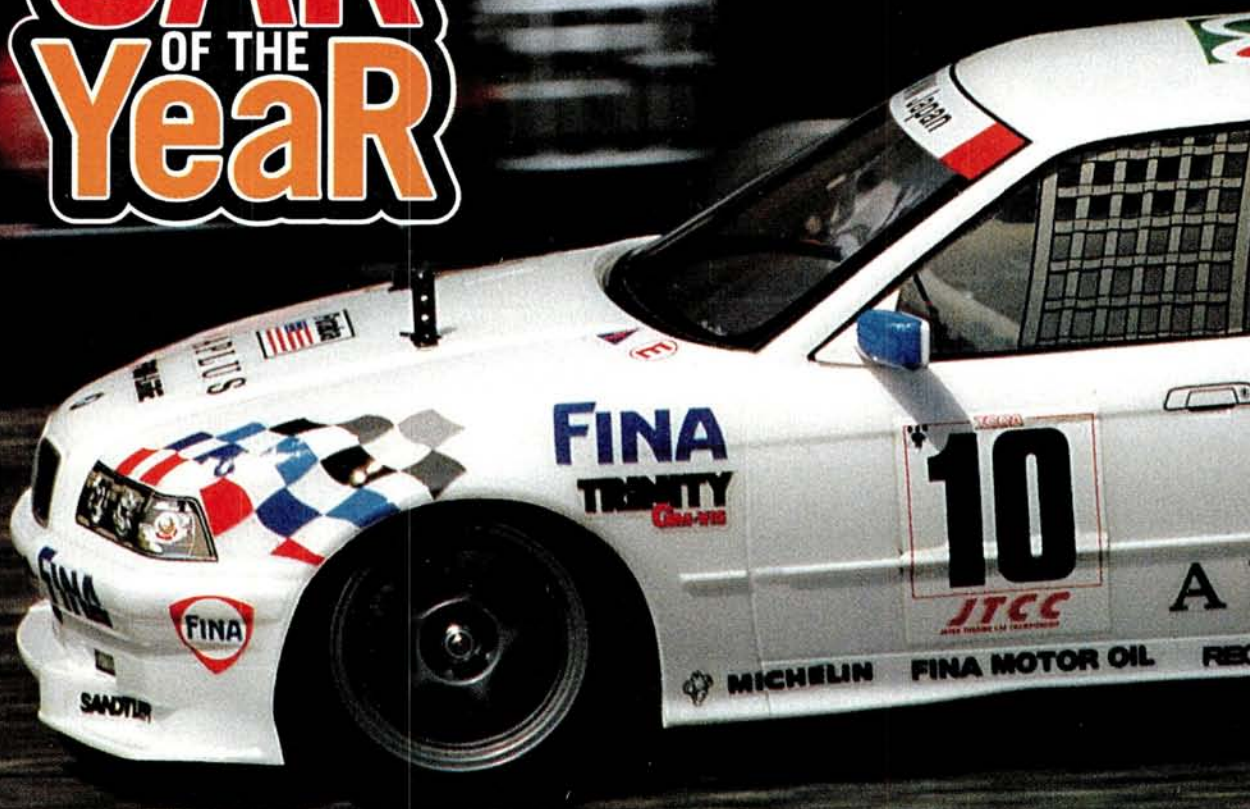
FINAL THOUGHTS

So what do you need to start building your own PBT3? Well, I highly recommend that you start with ESP's Clodzilla IV Full Race Package, two hot "torquey" modified motors and the Pro-Line tires. The rest of the stuff is more "show" than "go." Stock Clod Buster gearboxes, axle tubes and wheels get the job done, and two regular mod motors will help you get going a little more easily. PBT3 is one of my favorite R/C vehicles. If you've never had a monster truck in your stable, you just don't know what you're missing; they're way too cool!

I thank two people for all their help in completing this project: Eric Sutcliffe at ESP for all his info and setup tips and George Gonzalez for helping me with the motors. Stay tuned to *Car Action*: I can't fill you in on all the details, but we have big plans for this truck!

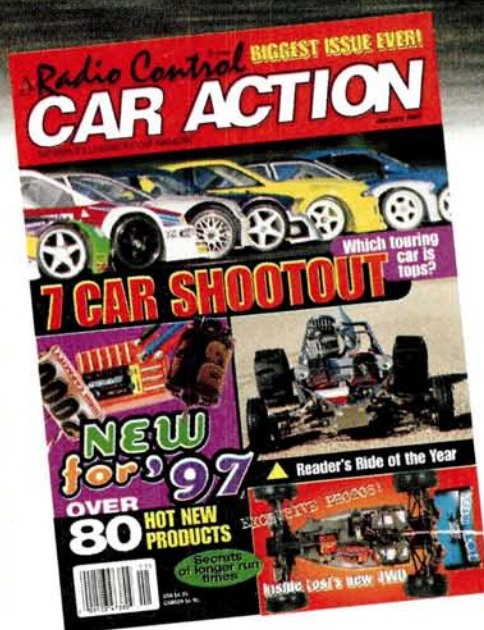
*Addresses are listed alphabetically in the Index of Manufacturers on page 193.

Radio Control 97 CAR ACTION CAR OF THE Year



by Frank Masi

WHEN IT WAS TIME to choose the '97 Car of the Year, we began by defining the selection criteria. To be eligible to win, a candidate must have been available to the public no earlier than January 1, 1996, and no later than February 1, 1997. From this list of new car kits, we then focused on finding one that, through outstanding innovation, performance, design or creativity, had clawed its way to significance in the highly competitive and very crowded marketplace that is the R/C car hobby.



In the January issue's seven-car shootout, the TA03F-Pro emerged victorious over the world's best.

TAMIYA

TA03

Radical

pays off!



specifications

SCALE 1/10
LIST PRICE \$356 (TA03F-Pro);
 \$312 (TA03F)

DIMENSIONS

Length overall 15.19 in.
 Wheelbase 10.1 in.
 Width (F/R) 7.19 in.

CHASSIS

Type (TA03F-Pro) Upper/lower
 FRP plates
 TA03F Molded plastic tub

DRIVE TRAIN

Type Twin-gearbox, belt-driven 4WD
 Primary Pinion/spur
 Transmission Stainless-steel
 dogbones/axles
 Differential(s) Adjustable ball diffs (Pro);
 bevel-gear (TA03F)
 Bearings/bushings Maintenance-free ball
 bearings (Pro); plastic bushings (TA03F)

SUSPENSION (F/R)

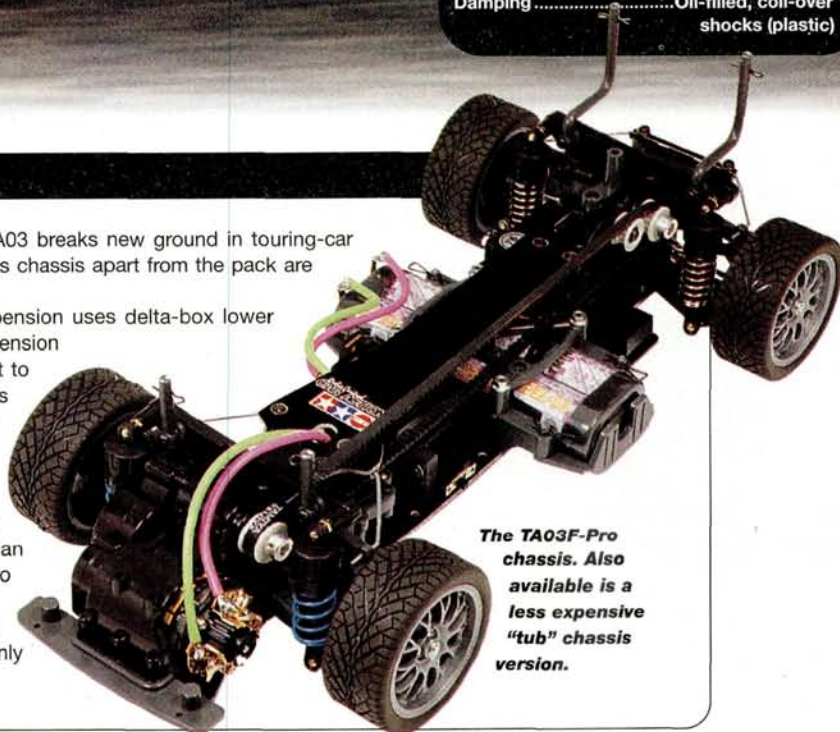
Type Independent: lower arm w/upper link
 Damping Oil-filled, coil-over
 shocks (plastic)

Technology Triumphs

With its front-motor, 4WD drive train, the TA03 breaks new ground in touring-car design and handling. But what really sets this chassis apart from the pack are its thoughtful features—typical Tamiya.

At all corners, its fully independent suspension uses delta-box lower arms with plastic, oil-filled shocks. Its suspension geometry allows the shocks to stand upright to clear the front/rear gearboxes, yet it still has the progressive damping needed for high-speed maneuvering.

Both gearboxes are fully sealed against dirt and debris, and all of the internal gears can be swapped between front and rear. In fact, the chassis is so versatile that you can actually swap the gearboxes themselves to create a mid-motor TA03! In tub-chassis form (available with one of several body sets) or in its Pro version (available as a chassis-only kit), the TA03 packs a technological wallop!



The TA03F-Pro chassis. Also available is a less expensive "tub" chassis version.

That the Tamiya* TA03F 4WD touring-car chassis is our top pick this year—by a unanimous vote—exemplifies the effort that went into making it both a world-class racing machine and an affordable parking-lot run-about. This duality is what has endeared the TA03 to us as well as to those thousands of other enthusiasts in the U.S. and abroad.

In its Pro form (the TA03's first incarnation, released last summer), Tamiya's successor to the popular TA02 series has proven to be the equal of any top-line touring chassis (as evidenced by its first-place standing in our January '97 issue's seven-car shootout). Take, for example, the performance of Tamiya America's Dave Jun, who put his TA03 in the pole position at last year's ROAR and NORRCA On-road Nationals. Jun finished second at the ROAR Nats and won the NORRCA Nats with a car that was essentially box-stock; he even used the kit's plastic

shocks and non-adjustable upper suspension links!



Tamiya America's Dave Jun captured the NORRCA national championship using a box-stock TA03F-Pro.

The TA03F-Pro is set apart from the pack by its unique and highly functional design. It's the only 4WD touring-car chassis that has its motor mounted all the way up front, in a similar fashion to Tamiya's own FWD TA02FF chassis. The advantages of this layout are that the motor's weight helps prevent the front of the chassis from rising during acceleration, which allows all four tires to achieve better grip. Also, the weight of the motor over the front suspension provides increased steering at all speeds and through all types of turns.

Another example of how the TA03 differs from other chassis is its drive system, which consists of two separate, but identical, gearboxes front and

rear. These sealed transmissions are joined by an external drive belt that can be removed in seconds to facilitate maintenance or adjustment of the front/rear drive bias (the front and rear transmissions can be set to operate at different speeds by installing belt pulleys of different sizes).

The more recently released sport model is a "de-tuned" TA03F that has a molded tub chassis in place of the Pro's dual-deck FRP chassis; bushings instead of ball bearings; and gear diffs instead of ball diffs. The TA03 epitomizes Tamiya's design and manufacturing capabilities and its commitment to excellence. All the parts fit together precisely, and with its easy-to-follow and well-illustrated instruction manual (widely recognized as the best in the industry), building an '03 is almost as enjoyable as running one.

Tamiya's TA03: a unique and effective design, an international sales success and a car that's both a high-end racing machine and an ideal cul-de-sac cruiser. Oh, yes; and now, *R/C Car Action's* 1997 Car of the Year.

**Addresses are listed alphabetically in the Index of Manufacturers on page 193.*

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ATOMIC
RACERS**



Present the 2nd Annual

WATERMELON GLASSIC

JULY 25th, 26th & 27th

ENTRIES: May enter up to 3 classes, 1 Free T-shirt per entrant, **Early Entry Closes July 18th**
CLASSES: 1/10th scale 2wd Stock & Mod, Truck Stock & Mod, 4wd Mod, & Gas Truck
FEES: Stock \$40 with handout motor, Mod & Gas \$35
SCH: Fri: Open Practice, Sat: 2 Qualifiers, Sun: Qualifier, Concurs & Mains
INFO: Confirmation will be mailed containing map, motels, etc.
 Existing track, elevation changes, off-camber & banked turns, jumps, fast sections, etc.; ROAR rules apply; **FANTASTIC DOOR PRIZES**
Qs: Bill @ 706-855-0846 or E-mail: jackson@ifx.net or Track @ 803-642-0314

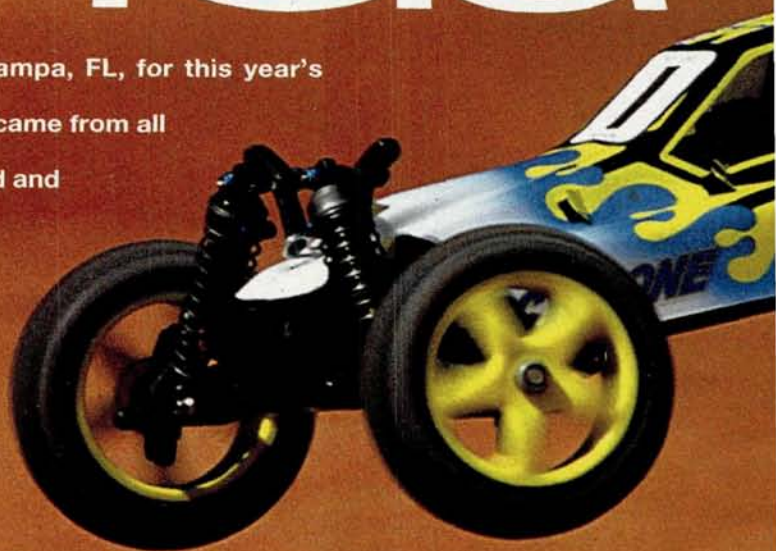
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Street _____		City _____		State _____ Zip _____	
Class _____	Chan. 1st _____	2nd _____	3rd _____	(No Odd 75 Mhz)	
Class _____	Chan. 1st _____	2nd _____	3rd _____	Free T-Shirt size: M L XL XXL	
Class _____	Chan. 1st _____	2nd _____	3rd _____	Entry Fee (\$)	
Make Checks payable to: ORA				Late Fee(s) \$5/entry _____	
Limited to 1st 250 Mail to: 373 Boyd Pond Rd				Extra Motor(s) @ \$20 ea _____	
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Aiken, SC 29803				TOTAL _____	

1/10th Scale Off Road Racing @ it's Best !

JULY 25th, 26th & 27th

A Pre-Worlds Warm Florida

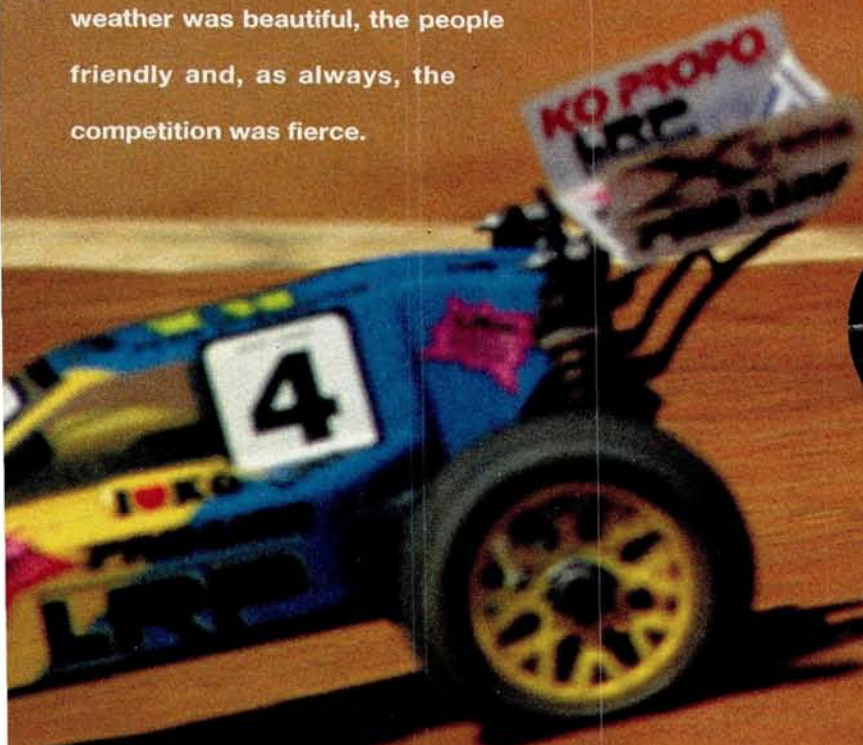
ROUGHLY 450 RACERS gathered in sunny Tampa, FL, for this year's Team Losi Winter Champs race. Competitors came from all over the U.S. and from as far as Japan, Brazil, England and Finland. Aside from the upcoming IFMAR Off-Road Worlds in Southern California this year, the annual Winter Champs is the largest off-road race in the country. It has even surpassed the ROAR Off-Road Modified Nats in size and, some would argue, in stature. For the most part, the weather was beautiful, the people friendly and, as always, the competition was fierce.



Article and photos by John Howell



Checking out the racing action are (from left to right) Team Losi's Chris White, Sohrab Tavokoli, Gil Losi Jr., Gil Losi Sr. (background), and Bob Novak.



Sponsored by Team Losi and *Car Action*



Winter

Summer

International Flavor

The best in the world race here!

As I mentioned earlier, the Winter Champs race attracts racers from all over the world. This year, most notably in attendance were Japan's Masami Hirose, England's Craig Drescher and Finland's Jukka Steenari. While there was a lull in the racing action, I sat down with each racer and asked him a few questions regarding racing in the U.S., how it differs from racing in their country, so on and so on. Here's what they had to say.

Name: Masami Hirose.
Home: Tokyo, Japan.
Age: 26.
Racing credits: eight IFMAR titles and roughly 50 Japanese national titles.
Hobbies: R/C, relaxing at home, computers.
Favorite type of racing: "I like them all. I can't pick just one."
Years in R/C: "Quite a few"

Masami Hirose is easily the most dominant R/C racer in his homeland. He is multi-talented and is arguably the best overall R/C racer in the world. In Japan, Masami works for Yokomo, and he's a celebrity in the R/C community.

JH: One of the more interesting topics at this race is that you are racing in the truck class. I've never seen you race trucks before. Have you?
MH: I raced a club race here last week, and before that, I raced trucks once before at the Yatabe Arena in Japan for a fun race about three years ago.

JH: How does racing trucks

compare to racing 4WD and 2WD?

MH: I find it easy [laughs]. I now understand why first-time racers pick trucks to start with. I like it.

JH: What made you decide to race trucks?

MH: Just to get some more experience. Since there were three classes, I wanted to run all three.

JH: There was a rumor flying around the pits that the only reason you ran trucks is that Mark Pavidis wasn't initially going to run 4WD and he made you agree to run truck if he ran 4WD. Any truth to the rumor?

MH: No, that's not entirely true. We were joking around in the pits about it, and I told Mark I didn't have a truck, but if he would build one for me, I would run it.

JH: Who are your toughest competitors?

MH: Mark Pavidis, Barry Baker, Greg Hodapp and Brian Kinwald.

JH: With the IFMAR Worlds coming up fast, does Yokomo plan to release a new car for it? There are

rumors that you are testing cars that are better suited to rough tracks.

MH: We haven't started working on it yet. We're going to start soon. I do have something here that I'm working with, though.

JH: What is your preparation for racing at the Worlds?

MH: While I'm in Japan, I won't be doing as much competitive racing as I do here. I'd like to experience some more close racing like this before the Worlds.

JH: What is the situation like for you racing in Japan? Do you have any competition, or are you in a different league from everyone else?

MH: The guys on my team are pretty competitive, but most



of them are in school all the time, so I can't really practice with them.

JH: Is it a major disadvantage coming here and

racing against those who live in the U.S.? Is there a major "home court" advantage?

MH: I don't think there's a huge disadvantage. I think I arrived here a little earlier than everyone else, so it gave me a chance to get used to being here.

JH: Any early predictions for the Off-Road Worlds? Who do you think will be strong?

MH: Losi.

JH: Really? Well, if you had to pick one person in each class to be the toughest competitor, who would it be?

MH: Brian ... in both.

JH: What advice would you give to a newcomer to racing?

MH: Enjoy it as much as possible!

International Flavor



Name: Jukka Steenari.
Home: near Helsinki, Finland.
Age: 20.
Racing credits: '95 European 2WD champ and '96 European 4WD champ.
Hobbies: "I just started school, and it takes up all my time."
Favorite type of racing: 2WD and 4WD off-road.
Years in R/C: 12.

Jukka Steenari is wiser than his 20 years would allow you to think. He's well-spoken (he speaks fluent English), polite and very friendly. He's also a focused and talented R/C racer. This 2WD and 4WD champion is a dominant figure in the European R/C arena. Look to see more of him in the future.

JH: Tell me a little about your-

self. Where are you from, and how long have you been racing?

JS: I'm from Finland and I live near Helsinki. I've been racing for almost 12 years, and I started with Tamiya cars. Later on, I got involved with Schumacher, and I've been racing with them for quite a few years.

JH: How does racing in Europe differ from racing here?

As with any big race, there were a few hang-ups here and there, and a few racers did voice some negative opinions, but all in all, John Grant and the rest of the West Coast R/C Club did the best they could to get through the program as smoothly as possible.



At big races such as this, there is always a hot topic or two floating through the pits. So what was hot at this event? Without a doubt, four-wheel drive. With the Losi XX-4 creating such a stir in the industry, it was interesting to see Yokomo's Masami Hirosaka and the current European Champion, Schumacher's Jukka Steenari attending the event. Both racers arrived with subtly revamped 4WDs. Were the two companies these racers represent starting to sweat? It looked like it.

Speaking of hot topics of interest ... How about Masami Hirosaka racing

What does racer Chris White credit all his success to? Team Losi's pure Silatech silicone shock oil—he just can't get enough of it...



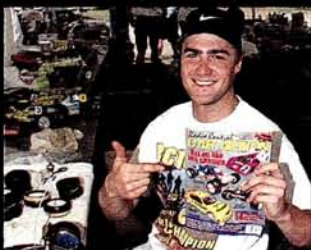
Believe it or not, this photo was taken prior to the running of the third A-Main in the four-wheel drive class. Racers had to compete against each other in almost complete darkness!

in the truck class?! Regular race fans should know by now that Masami races 2WD and 4WD, but he has never raced trucks in the U.S. I found out it was only the second time he has raced in this class. When I asked him when he last raced truck, he said it was over three years ago in Japan for a "fun" club race at his local track.

MONS VENUS MONEY



Name: Craig Drescher.
Home: Seisdon, England.
Age: 21.
Racing credits: nine European championships, five BRCA championships.
Hobbies: Craig's friends are very important to him. He spends a lot of time with them going clubbing, skiing and hanging out.
Favorite type of racing: 1/10-scale electric off-road.
Years in R/C: 11.



Craig is always a threat on the European R/C racing scene. He has many National and European titles to his credit, but he never loses focus on having fun outside the R/C world. Before coming to the Winter Champs, he and 15 of his friends took a long skiing vacation in Europe.

JH: What was your first R/C car?

CD: A Tamiya Frog.

JH: Which class do you like to race more of: 2WD or 4WD?

CD: I used to prefer 4WD, but now I have a tendency to go more toward 2WD; it's the most competitive class. I also like to do a bit of 1/12- and 1/10-scale (on-road) racing as well. I kinda like the change going to big

races, getting into the frame of mind for racing. I feel that if you prepare yourself mentally, you can race anything competitively.

JH: Who would you count as your toughest competitors here at this race?

CD: I don't think there's just one person actually. It's the main run of them—Greg, Brian, Mark. Then there are other people who run fast but are inconsistent. I'd say mainly Greg, Brian and Mark. Barry Baker has also been running fast.

JH: There's a big difference between racing in Europe and in the U.S. How are you consistently fast over there and here, too? How difficult is it to adapt to different terrain?

CD: Because of my experience, it's not as difficult for me as it is for some other people. I've traveled since I was very young; that's why I've been able to adapt very well. In racing, I have trouble adapting to the amount of track time you get here. In England, you have one practice run before qualifying. You car could work fine, or you might have to change the whole thing and be confident going into qualifying. I have trouble coming to a race like this, starting out and changing little things—I seem to run out of things to fine-tune [laughs].

JH: Do the American team guys help you with setups?

CD: I'd say so pretty much. At the end of the day, everyone

JS: It's totally different. We have a few dirt tracks, but the clay surfaces are different. Driving styles are different, and the motors used here are different.

JH: You mean the motor winds specifically?

JS: Yes, because we primarily run 5-minute races instead of 4. Also, over here, the driving styles are more aggressive because there is less time in

the race to win.

JH: Do you find it easier to race for 5 minutes or 4 minutes?

JS: It's not easier or harder; it's just different. I do find I need to be more conservative while racing in Europe, and this makes the transition to racing over here a little more difficult.

JH: Who would you count as your toughest competitors here?

JS: All of the top Losi and Associated guys. I would like to pick one, but they're all consistently fast.

JH: What advice would you give to newcomers to the racing scene?

JS: Practice is very important. Even at the top level, I feel that some of the drivers don't practice enough. What I've found is that it doesn't matter what kind

of a champion you are; you have to practice, and practice a lot. If you're patient and you concentrate on what you do, then you're there. That's what happened to me.

JH: Any early predictions for the Worlds? Who do you think will be strong?

JS: All the U.S. guys will be strong. It's going to be interesting to see, though.



Top: 2WD Stock. Bottom: 2WD Modified.



It would be interesting to see whether he would be on the pace with the regular "pickup pilots."

QUALIFYING

The overall winner in each of the modi-

W i n n e r s

2WD Stock

Fin.	Qual.	Driver	Chassis	Motor	Battery	ESC	Radio	Body	Tires(F/R)
1	1	Travis Scrambling	Assoc.	Handout	Orion	Tekin	Airtronics	Assoc.	Losi/Pro-Line
2	7	Dave Grabowski	Assoc.	Handout	Trinity	Novak	Airtronics	Assoc.	Pro-Line
3	6	Rick Linn	Assoc.	Handout	Reedy	LRP	Airtronics	Assoc.	Pro-Line
4	2	Jason Ladow	Losi	Handout	Orion	Tekin	JR	Losi	Losi/Pro-Line
5	9	Rob Michael	Losi	Handout	Orion	LRP	Futaba	Losi	Losi/Pro-Line
6	3	Christopher Marsh	Assoc.	Handout	World Class	Novak	Airtronics	Assoc.	Losi/Pro-Line
7	8	Rob Meyer	Losi	Handout	Powerline	Novak	Airtronics	Jammin'	Losi/Pro-Line
8	10	Welby Nalls	Losi	Handout	Wobblized	Novak	JR	Protoform	Losi/Pro-Line
9	5	Jeffrey Abler	Losi	Handout	Perfect Match	Novak	Airtronics	Jammin'	Losi/Pro-Line
10	4	Tony Crowell	Losi	Handout	Orion	Novak	Airtronics	Losi	Losi/Losi

2WD Mod

Fin.	Qual.	Driver	Chassis	Motor	Battery	ESC	Radio	Body	Tires(F/R)
1	1	Mark Pavidis	Assoc.	Reedy	Reedy	LRP	Airtronics	Assoc.	Pro-Line
2	10	Mike Mellin	Losi	Trinity	Trinity	Novak	Airtronics	Losi	Losi/Pro-Line
3	2	Brian Kinwald	Losi	Trinity	Trinity	Novak	Airtronics	Losi	Pro-Line
4	8	Scott Brown	Losi	Trinity	Trinity	Novak	JR	Losi	Losi/Pro-Line
5	5	Jason Ruona	Assoc.	Reedy	Reedy	LRP	Airtronics	Assoc.	Pro-Line
6	7	Sohrab Tavakoli	Losi	Trinity	Trinity	Novak	Airtronics	Losi	Losi/Pro-Line
7	9	Richard Saxton	Assoc.	Reedy	Reedy	Novak	Airtronics	Assoc.	Pro-Line
8	3	Barry Baker	Assoc.	Maxtec	Maxtec	Tekin	Airtronics	Assoc.	Pro-Line
9	6	Jimmy Jacobson	Assoc.	Reedy	Reedy	LRP	Airtronics	Assoc.	Pro-Line
10	4	J.R. Mitch	Losi	Trinity	Trinity	Novak	Airtronics	Losi	Losi/Pro-Line

fied classes would be determined by running the triple A-Main format. The Stock A-Main winner, on the other hand, would be determined by a single Main.

• 2WD Stock. Travis Scrambling proved he was the man to beat as he piloted his Team Associated RC10B2 to the top of the field.

wants to win, so if there is something that they do discover, unless it's something substantial that is going to benefit the whole team, then they'll keep it to themselves; basically everyone does. But, in general, we work very, very well as a team. If we have a problem, we'll all get together and work out things to try and then get back together after that and go over the info.

JH: How do our "blue-groove" tracks compare to the surfaces you race on?

CD: They're completely different. Our traction is different. We run on harder compound tires, larger spikes, and the track layouts are more spaced out.

JH: Any early predictions for the Worlds?

CD: I'd like to see someone different win it, to be honest. Obviously, I'd like to see myself win it [smiles], but you're gonna get the usuals again. Again, I'd like to see someone different; I suppose Matt Francis did that in Japan. He had a really good week, and everything went perfectly for him, so it can happen.

JH: Do the Americans hold the advantage going into the Worlds?

CD: Definitely. Not because the track is in America though, but because they know how to jump; that can save you so much time. It gives you a lot of confidence.

JH: Are there a lot of jumps on the tracks in Europe?

CD: No, they're relatively flat. It's quite rough though—rippy. I love the tracks over here because you can get into a good rhythm; they're smooth. The cars work as they should.

JH: What are the most noticeable differences between racing in Europe and racing here?

CD: Professionalism and track time. You have the facilities to put the track time in. In Europe, we make the most of what we've got. That's why we're "there," but not always "right up there" when we come over here. Things are changing, though. Plus, the weather always stops us from doing a

lot of things. We couldn't have an outdoor facility like this. Everything is bigger over here: the races are bigger, the entries are bigger. It's a lot better organized.

JH: Which countries dominate R/C racing in Europe?

CD: It's mostly England, and the other countries follow. So far, the English dominate. It's kinda like how the Californians dominate over here.

JH: What advice would you give to a newcomer to R/C?

CD: Take it slow, don't expect too much, and work hard at it and enjoy yourself. That's the main thing. Go out there and learn from everybody else, be polite and have fun!

W i n n e r s

Truck Mod

Fin.	Qual.	Driver	Chassis	Motor	Battery	ESC	Radio	Body	Tires(F/R)
1	3	Brian Kinwald	Losi	Trinity	Trinity	Novak	Airtronics	Stock	Losi/Pro-Line
2	2	Jason Ruona	Assoc.	Reedy	Reedy	LRP	Airtronics	Stock	Pro-Line
3	5	Greg Hodapp	Losi	Trinity	Trinity	Novak	Airtronics	Stock	Losi/Pro-Line
4	1	Alex Guerrero	Losi	Maxtec	Maxtec	Novak	Airtronics	Stock	Losi/Pro-Line
5	4	Mark Francis	Assoc.	Reedy	Reedy	LRP	Airtronics	Stock	Pro-Line
6	8	Masami Hirosaka	Assoc.	Reedy	Yokomo	Tekin	KO	Stock	Pro-Line
7	7	Richard Saxton	Assoc.	Reedy	Reedy	Novak	Airtronics	Stock	Pro-Line
8	6	Craig Drescher	Assoc.	Reedy	Reedy	LRP	Sanwa	Stock	Pro-Line
9	9	Scott Hughes	Assoc.	Reedy	Reedy	LRP	Futaba	Stock	Pro-Line
10	10	Mark Pavidis	Assoc.	Reedy	Reedy	LRP	Airtronics	Stock	Pro-Line

4WD Mod

Fin.	Qual.	Driver	Chassis	Motor	Battery	ESC	Radio	Body	Tires(F/R)
1	1	Jukka Steenari	Schum.	Corally	Orion	LRP	Sanwa	Stock	Pro-Line
2	2	Masami Hirosaka	Yokomo	Reedy	Yokomo	Tekin	KO	Stock	Pro-Line
3	3	Mark Pavidis	Yokomo	Reedy	Reedy	LRP	Airtronics	Stock	Pro-Line
4	4	Scott Brown	Losi	Trinity	Trinity	Novak	JR	Stock	Losi/Pro-Line
5	8	Barry Baker	Yokomo	Maxtec	Maxtec	Tekin	Airtronics	Stock	Pro-Line
6	6	Brian Kinwald	Losi	Trinity	Trinity	Novak	Airtronics	Stock	Pro-Line
7	5	Greg Hodapp	Losi	Trinity	Trinity	Novak	Airtronics	Stock	Pro-Line
8	7	Teemu Leino	Schum.	Corally	Orion	LRP	Sanwa	Stock	Pro-Line
9	9	Derek Furutani	Losi	Maxtec	Maxtec	LRP	Airtronics	Stock	Pro-Line
10	10	Alex Guerrero	Losi	Maxtec	Maxtec	Novak	Airtronics	Stock	Pro-Line

Drescher (two racers who don't regularly race trucks in their respective countries) made the A-Main grid.

• **4WD Modified.** Surprising quite a few people was Schumacher's Jukka Steenari, who drove to the head of the pack with his Schumacher CAT 2000.

MAINS

Stock

• **A-Main.** TQ'er Travis Scrambling piloted his B2 to an early lead over second qualifier Jason Ladow and his Team Losi Double-X. Scrambling and Ladow tangled early on, but Scrambling took

command quickly. Ladow was all over his back door. Seventh-place qualifier Dave Grabowski quickly took his B2 up through the pack and was tied together tightly with a pack of four battling for third. After a minor collision toward the front, Grabowski took second with Ladow a close third. At this point, Scrambling was way out in front and he had only to keep the car on its wheels to ensure victory. As the seconds ticked away, Ladow battled with Rick Lynn and his B2. Lynn made it past Ladow at the end, and at the buzzer, Scrambling took the win, followed by Grabowski and Lynn.



4WD Modified.



Truck Modified.

• **2WD Modified.** For a while, Barry Baker was on top with his B2, but it was Team Associated's Mark Pavidis who beat out many talented drivers and placed first overall.

• **Truck Modified.** The TQ bounced around considerably, but after the dust had settled, it was Team Losi's Alex Guerrero out in front. Surprisingly, Masami Hirosaka and England's Craig

NEW IN THE PITS • NEW IN THE PITS • NEW

FANTOM Aluminum B2 Pieces

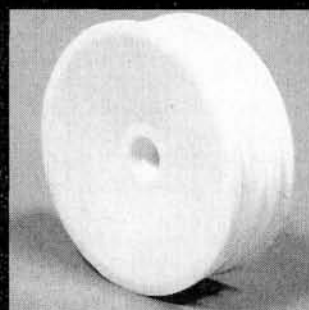
Fantom now offers aluminum replacement parts for the Team Associated RC10B2. Currently available are the front bulkhead (F355, \$39.98) and transmission brace (F354, \$21.98). The pieces are available in bright blue and purple-anodized or natural finishes. They are machined out of high-quality aluminum. T2 parts are on the way, so stay tuned!



TEAM ASSOCIATED 2.2 Front Buggy Wheels

Team Associated has released its newest front 2.2 wheel for the B2 buggy (part nos. 9481B, black; 9481Y, yellow). So why make a 2.2 wheel? Well, Associated wanted to standardize its wheel sizes and be able to run soft compound tires

with lower profiles. Less rubber on the tire equals less rotating mass (rubber weighs more than the wheel material). As of now, the new wheels are optional pieces, but they will more than likely be found as standard equipment in future kits.



PITS • NEW IN THE PITS • NEW IN THE PITS

Truck Modified

• A1. At the start, TQ'er Alex Guerrero jumped out to an early lead, followed by Jason Ruona (second qualifier) and Brian Kinwald. Early on, Ruona and Guerrero tangled, and Ruona was momentarily stalled as Kinwald moved past him into second. It didn't take fourth-place Craig Drescher long to pass Ruona, either. Eventually, Kinwald slipped by Guerrero, and Greg Hodapp jumped into third. Masami moved to fourth overall, and at the buzzer, Kinwald took the win followed by Guerrero and Hodapp.

• A2. Guerrero jumped to the lead with Ruona second and Kinwald third. Mark Francis made his way up to fourth. Guerrero got stuck on a pipe, and Ruona inherited first place and Kinwald second. Ruona and Kinwald pulled away from the pack and stretched the lead. Kinwald bobbled slightly and gave Ruona some breathing room. Hodapp began to work his way up and found himself third. Kinwald put the throttle down and gained ground on Ruona. Entering the straightaway, Kinwald tapped Ruona and sent him off to the side of the straightaway, and Kinwald took over first—a move that prompted plenty of boos. After watching a videotape of the race, all I can say is, "rubbin' is racin'," and I've seen more questionable moves that never even generated a response from the crowd. On the last turn, Ruona hit the pipe and, as a turn marshal righted Ruona's truck, he accidentally kicked Hodapp's as he was rounding the turn and spun him around, costing Greg third. As Hodapp straightened himself out, Francis moved into

third. At the end, it was Kinwald, Ruona and Francis.

• A3. With the win clinched, Kinwald sat out the final Main. Guerrero lost the lead to Ruona early, and Francis moved to third while Hodapp sat in fourth. It didn't take long for Hodapp to move into third, and Guerrero was all over Ruona. Guerrero got tangled up, and Hodapp took advantage, moving into second. Ruona never looked back and led the race almost from start to finish. At the buzzer, he clinched the win, Hodapp took second and Guerrero third.

2WD Modified

• A1. Off the start, TQ'er Mark Pavidis jumped out to the lead and slowly distanced himself from the pack. He was followed by Kinwald and Baker. Ruona passed Baker quickly and moved to third, and Mike Mellin also managed to get by Baker. Mellin soon began to reel in Ruona. Ruona got hung up and Mellin slipped into third. At the buzzer, the win went to Pavidis, followed by Kinwald and Mellin.

• A2. Pavidis jumped out to the lead, but this time, Kinwald wasn't so far behind. Baker sat back in third while J.R. Mitch sat in fourth. Toward race's end, Pavidis still maintained the lead, but he was getting a ton of pressure from Kinwald. As the seconds ticked down, Kinwald made a desper-

ate move, took out the back of Pavidis' car and they both spun out. The crowd went wild with boos! A marshal stepped in and rightfully put the leaders back on the track with Pavidis in front. Pavidis managed to get to the straightaway first and won. Kinwald settled for second.

• A3. Having captured victory, Pavidis opted to sit out the third Main. Kinwald took an early lead, but he got hung up, and Baker slid past into the lead. Baker was closely followed by J.R. Mitch. Coming into the straightaway, the two tangled and Mitch got the worst of it. Mellin made his way toward the front and challenged for the lead, but he crashed. At this point, it was Baker, followed by Richard Saxton and Jason Ruona. Soon, there was a huge pile-up and Mellin snuck past and into the lead. Ruona took over second and Scott Brown third. At the end there was much

(continued on page 170)

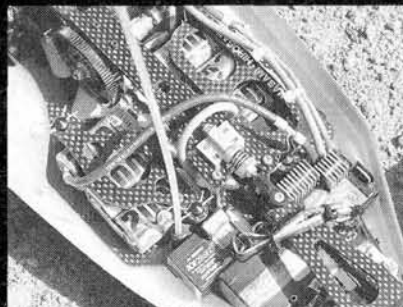


Race director

John Grant is seen here giving away door prizes.

John and the rest of the West Coast R/C Club did their best to keep the race running smoothly throughout the hectic weekend.

THE PITS • NEW IN THE PITS • NEW IN THE



YOKOMO Prototype "Rough Track" YZ-10 4WD

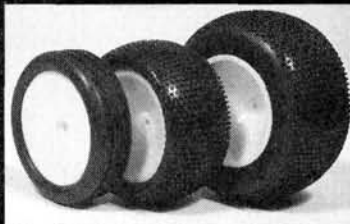
Masami Hirotsuka showed up with this specially modified, prototype Yokomo YZ-10 Worlds car. Its most notable fea-

ture is the new two-piece upper deck that incorporates a shock setup between the two plates. The rest of the car is fairly standard equipment. The new car was designed specifically to be a better performer on rough tracks. The Winter Champs course was fairly smooth, so this new buggy might not have been able to give Masami the feedback he needed, but we'll just have to wait and see what Yokomo has in store for us at the IFMAR Worlds.

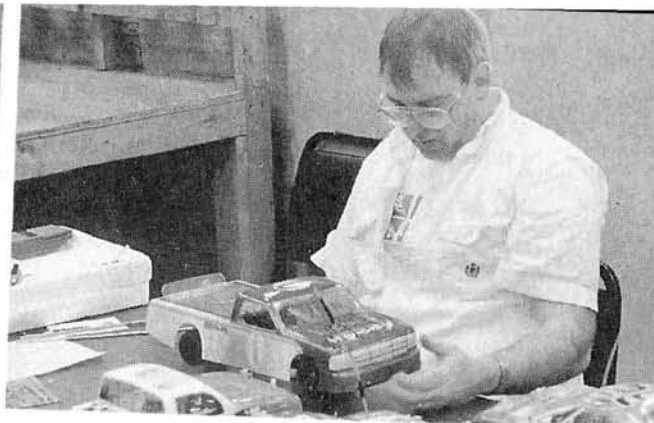
PRO-LINE Holeshot tires and 2.2 Wheels

Pro-Line debuted its Holeshot rear tires (8183M3 and 8183M2) with great success. All the top drivers, including 2WD Stock winner Travis Scrambling, Mod winner Mark Pavidis, 4WD winner Jukka Steenari and Truck Mod winner Brian Kinwald ran them at the event. Pavidis also mounted his Holeshots on Pro-Line's new 2.2 rear wheels (2606).

Another hot new Pro-Line tire that worked great was the "4-rib" 2.2 front tire (8175M3), and Pro-Line has a new 2.2 dish wheel (2608) designed specifically for the new front tire.



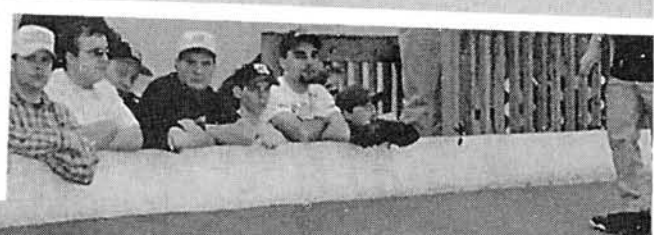
NEW IN THE PITS • NEW IN THE PITS • NEW



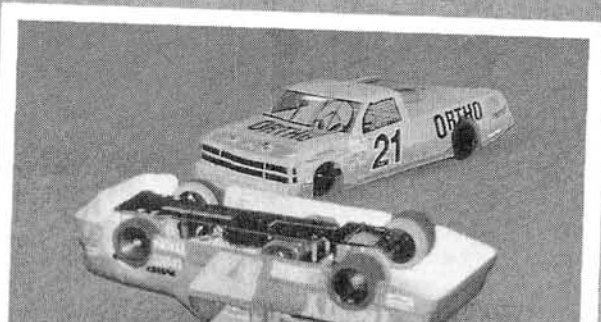
Above: track owner Jeff Setzer probably put the cars through more action on the tech table than they saw on the track. He checked the cars' weights, ride heights, motors, batteries and more before and after each race. Jeff wanted to make sure that racing would be equal for everyone. Left: Pro Spec drivers (left to right) Shane Kocher (first), Jake Flurer (second) and Dave Carpenter (third). Shane has the right to wear that grin; he TQ'd and won the race.

TRINITY *Street*

The intense racing in the Street Spec Nationals came to this final starting grid—the A-Main in Street Spec. R/C Car Action staff photographer Walter Sidas snuck into the infield to get some action shots but wound up as an involuntary turn marshal.

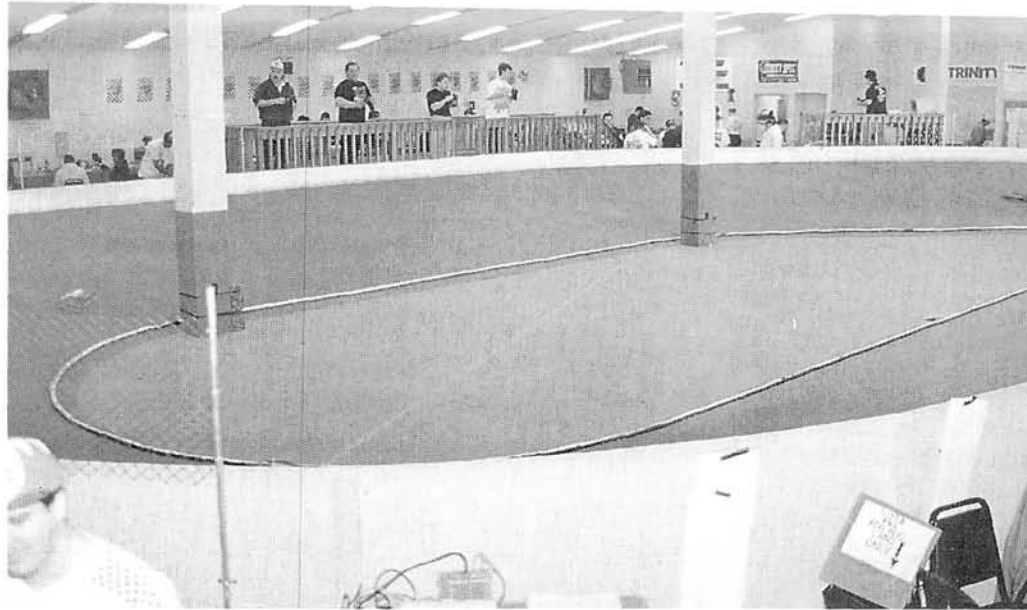


A level playing field creates **intense competition**





Above: Street Spec A-Main drivers (left to right) George McCauley (first), Jason Schreffler (second) and George Verbonitz (third). **Right:** the two-story racing facility looked like a historic building in Rome, but inside was a high-tech race venue. The track was so large that I couldn't take it all in with one photo!



Street Spec Nationals



PHOTOS BY GREG VOGEL AND WALTER SUGAS

STREET SPEC was created by the racing enthusiasts at Trinity to get both new and experienced racers involved in a low-cost form of competition in which driving skills are the equipment that wins. Trains and Lanes in Landsdale, PA, was the site for the Street Spec nationals, where 77 racers gathered to see who had the driving skills to walk home with the first-place trophy. This mad dash for the trophy made for exciting and close racing.

by Greg Vogel

The Trains and Lanes facility was the perfect venue to hold such an event. The building features a well-stocked hobby shop on its lower level for the racers' convenience and a large, banked, tri-oval on its upper level, which also has plenty of pit space for the drivers. Upon arriving and talking with the race directors, I found that the track had been converted from a flat oval to a banked oval three months before the race. The newly rebuilt facility, lap-counting system and on-the-ball race directors made for a perfect show. The race ran Friday through Sunday, and the racers were split into two classes as suggested by Street Spec rules. Seven sponsored drivers were placed in the Pro-Spec class, while the remaining 70 racers competed in the regular Spec class.

Spec Car Setup Tips

When I went through the pits, many people asked whether I would find out the setups of the winners' cars so they would be able to use them as base setups for their cars.

**STREET
SPEC
1ST
PLACE
FINISHER**

George McCauley's
Trinity Spec Car

- Front Green (left) and Orange (right) and rear Blue tires.
- Front White (left) and Green (right) springs.
- Trinity Red Stuff lubricant on the kingpins.
- Trinity Purple Stuff on the damper disk.
- Ballast added to left front chassis and upper axle plate.
- NASTRUCK body.

**STREET
SPEC
2ND
PLACE
FINISHER**

Jason Schreffler's
TRC Spec car

- Blue tires front and rear.
- TRC .22 springs in front.
- Race Prep comm drops on the kingpins and damper plate ("I'm not joking!").
- Ballast on the left front and left rear.
- NASTRUCK body.

WINNERS

1/10-SCALE SPEC

Fin.	Qual.	Driver	Chassis	Motor	Battery	ESC	Radio	Body	Tires (F/R)	Traction	Additive
1	2	George McCauley	TRC	Handout	Trinity	Novak	Futaba	Trinity	NA		Trinity
2	1	Jason Schreffler	TRC	Handout	Trinity	Novak	KO Propo	Trinity	TRC		Paragon
3	8	George Verbonitz	TRC	Handout	Trinity	Schumacher	JR	Bolink	TRC		Trinity
4	5	Alan Steck	TRC	Handout	Trinity	Schumacher	Futaba	Bolink	TRC		Trinity
5	6	Terry Laible	TRC	Handout	Trinity	Tekin	JR	Trinity	TRC		Racers Choice
6	4	Ed Thuresson	TRC	Handout	Trinity	Tekin	Futaba	Bolink	TRC		Trinity
7	3	Eric Beltz	TRC	Handout	Trinity	Tekin	KO Propo	Trinity	TRC		Paragon
8	7	Kevin Griffie	TRC	Handout	Trinity	Schumacher	Futaba	Bolink	BSR/TRC		Trinity

PRO SPEC

1	1	Shane Kocher	TRC	Handout	Trinity	Novak	Futaba	Trinity	TRC		Shane's
2	2	Jake Flurer	TRC	Handout	Trinity	Tekin	Futaba	Trinity	TRC		Trinity
3	4	Dave Carpenter	TRC	Handout	Trinity	M.troniks	Futaba	Trinity	TRC		Trinity
4	7	Mike Burns	Trinity	Handout	Trinity	Tekin	KO Propo	Trinity	Trinity		Trinity
5	5	Tony Fiorentino	Trinity	Handout	Trinity	Tekin	Futaba	NA	TRC		Trinity
6	6	Mike Wood	Trinity	Handout	Trinity	M.troniks	KO Propo	Trinity	TRC		Trinity
7	3	Rick Icker	Trinity	Handout	Trinity	M.troniks	Futaba	Trinity	TRC		Trinity

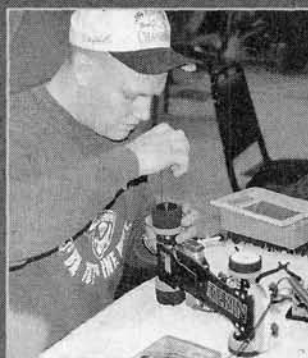


RACE FACES

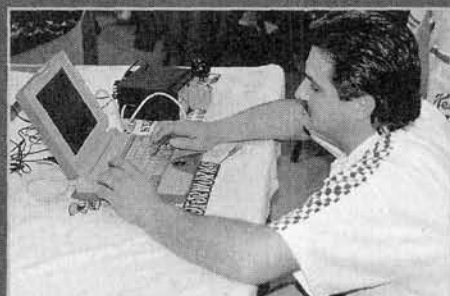
Many Street Spec participants were veteran racers who came close to calling it quits because of the high costs of being competitive. Street Spec's low-cost/level-field approach brought them back. Gege Showers (left) works on her husband A.G.'s car while he turns marshals. She says that they were very close to getting out of racing until they tried Spec racing. Travel is the only big expense they have to worry about now.

Mike Bowers (right) explained that he left racing for a while because he was tired of spending so much money. After racing for 10 years, he added up all of his receipts for his racing equipment and found that he had invested more than \$8,000.

"After buying a computer and a dyno for my motors, I woke up and realized that the sport was supposed to be for fun, so I left the racing scene," he said. Mike heard of Spec racing and decided to give it a try. The Street Spec Nationals was his first event, and he says that it's a lot more fun than other forms of stock racing where the rules are sometimes "overlooked." Mike finished sixth in the B-Main.



George Verbonitz (below) is also a veteran R/C racer. George has been involved in racing for 10 years. He has done it all, from off-road to on-road to oval. He



enjoys Spec racing just as much as the rest because it allows the cars to be equal, and driver skill is what counts. You may be saying, "He's using a dyno in the photo, so how fair can that be?" Well, it's fair because George let many other racers use the dyno to make sure their motors were running properly. Good sportsmanship such as this was seen throughout the pits!



The first-place trophy cup—one of the main reasons for the 77-driver turnout.

SPEC + MAINS = ACTION

• Spec class. All the Mains featured exciting and close racing, and for the first time in my experience, the A-Main was *not* the only event that drew a crowd. Racers emptied the pits and gathered around the track to see the lower Mains. The lower Main drivers had only one objective: to take no prisoners and do whatever it took to win that Main's trophy. Yup; there were a lot of cars crashing, hitting the walls, hitting the corners and going airborne. But when it was all over, everyone had had a great time and the crowd was really riled up.

Then it came to the A-Main. Jason Schreffler sat on the pole and had an excellent start, and the rest of the field fell in behind. Everyone shot around the track like a bullet train on rails until the 2-minute mark. At that time, second-place George McCauley decided it was time to jump the rails and take the lead. Schreffler fell into second and left the rest of the field to battle. And battle they did! Terry Laible, Alan Steck and George

(Continued on page 173)

Beginner's Building Tips

True Confessions of an R/C Wrench

by Rick Eyrich

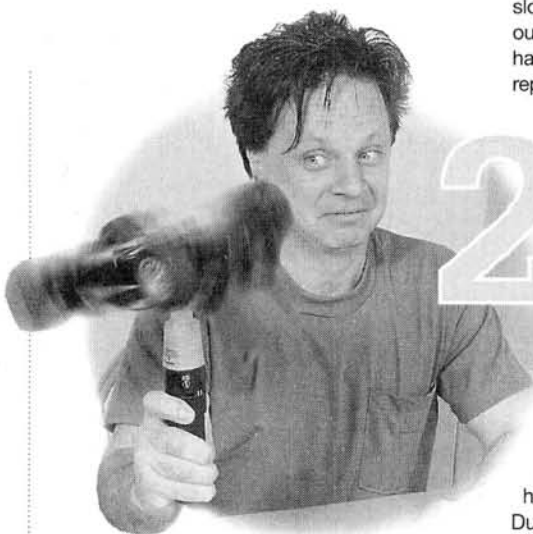
BECAUSE I HAVE an inquisitive nature, I tend to ask the R/C car folks I encounter what they'd like to see more of in the pages of this publication. Some ask for more racing action while others want additional articles on the best way to set up their cars for racing. Yet, among all the replies I get, the most frequently heard request is for more stories geared toward the R/C car beginner. This makes perfect sense to me, as I've witnessed firsthand how easy it can be for novices to get in over their heads. Hey, even experienced builders like our own Chris Chianelli forget the basics sometimes and need to be "re-schooled."

For the past few years, I've been the designated R/C car trouble-shooter for the local hobby shop. Whenever someone runs into car-building hassles, yours truly steps forward and attempts to cure the glitch. So, after many fix-ups, repairs and such, here's a handful of do's and don'ts I've learned along the way—just for the neophyte R/C car builders out there. Use them and prosper!



1 Makin' copies

Before you ever start to build, I highly recommend that you run your car's assembly guide through a copier. Store the original, and use the copy to assemble the vehicle. Now, you can mark off each step as you complete it or slop diff lube or shock oil on the pages without fear of damaging the print. Plus, you'll have the "clean" guide for parts ordering, repair reference, etc., on hand at all times.



2 Lock up your electric screwdrivers

DC-powered tools like your handy screwdriver can strip out soft, plastic car parts in a nanosecond! Two tricks to ease fastener installation will require either a tap (a device that's used to cut threads in drilled holes) or a candle. Companies such as Du-Bro*, K&S* and Great Planes* sell taps in both standard and metric sizes.

Now, cutting threads in metal/plastic parts will ease car assembly, but in a pinch, you can use regular candle wax to reduce the effort needed to install your vehicle's fasteners. Just rub a little wax on the threads of all those self-tapping screws that R/C car designers are so fond of, and insert the screw into the hole. The wax will act as a lubricant but won't loosen a screw once it's in place.



3 Easy does it

One word not to be associated with R/C car work is "force." Forcing parts into place will only result in non-moving car components, cut and bruised fingers and the need to reassemble pieces you should have already finished. This is the time you should hide all of the hammers as far away from your work area as possible.



Take your time

The word "speed" shouldn't be in the first-time R/C car builder's vocabulary. Additional problems occur when you attempt to do more work than your experience and temper can tolerate! Try to break up your routine this way: assemble the gearbox completely, stop, and do something simple like gluing the tires to the rims or sorting out your shock parts. The idea is to reduce "brain drain," and this in turn will ensure that your car goes together smoothly.



Don't cut, bend, staple, or otherwise mutilate your antenna wire!

The plastic antenna tube supplied with most R/C kits is usually too short to accommodate most receivers' antenna wire. I've seen people wrap the excess wire around servos, batteries and chassis. Worse, they cut off the excess wire! Doing this drastically shortens the range of your radio and may cause interference at any distance.

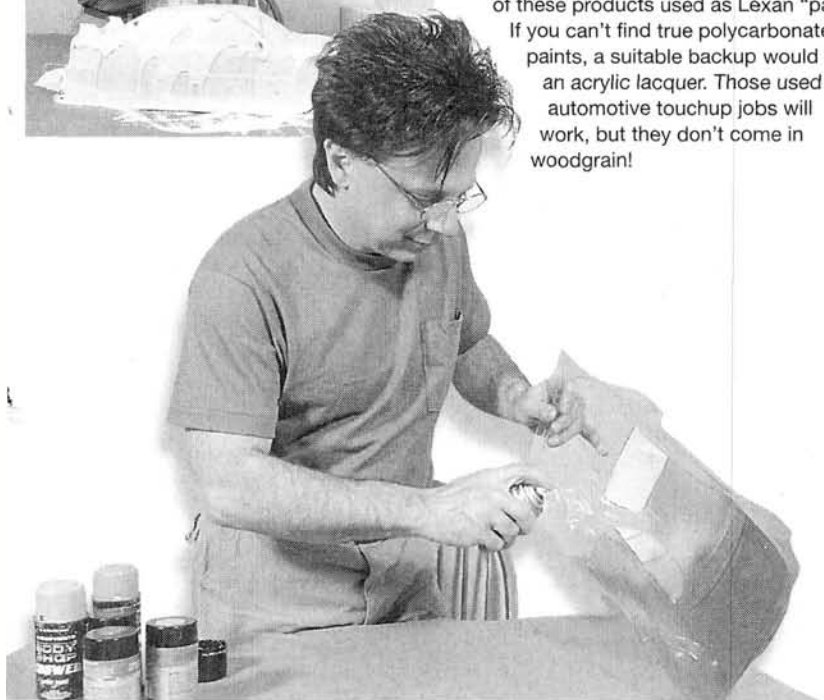
Instead, my technique is to pick up a 3-foot piece of Du-Bro's no. 511 antenna housing (tube) and cut it to the right length for the receiver's wire antenna. Another alternative is to use a Deans* Mini Antenna, but you'll have to cut and solder the receiver wire. If you must coil your antenna wire, ensure that it doesn't wind around itself and that you keep it away from power wires, i.e., those that go to the motor and battery.



Don't use house paint, wood stain, or shoe polish to coat your Lexan bodies!

You think I'm making this up, right? Not so. The "ingenuity" of some folks is amazing; I've actually witnessed all three of these products used as Lexan "paint."

If you can't find true polycarbonate paints, a suitable backup would be an acrylic lacquer. Those used for automotive touchup jobs will work, but they don't come in woodgrain!



SANYO

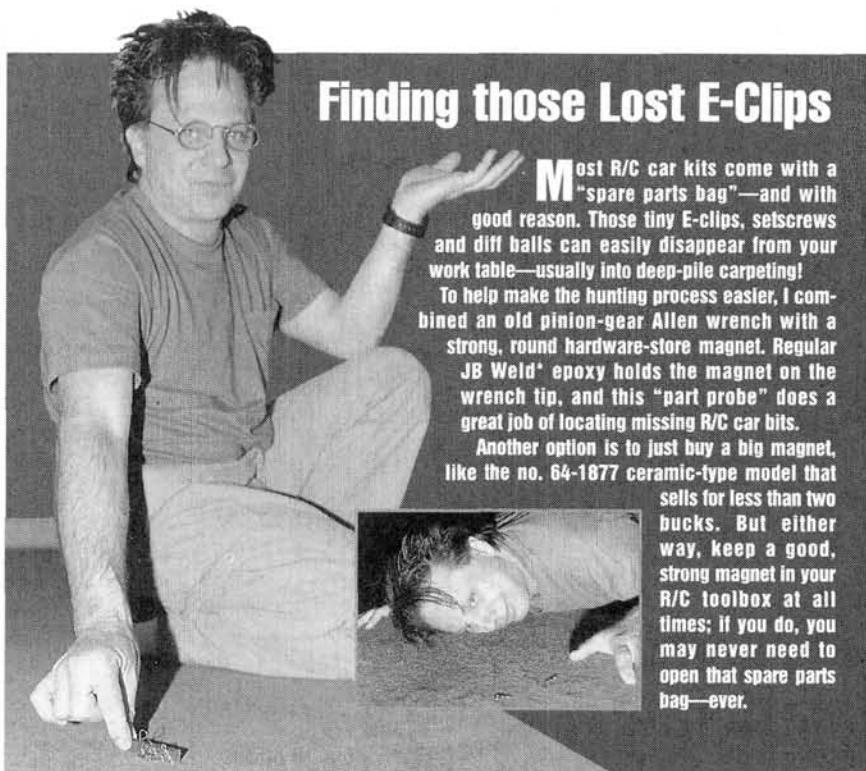
WHEN RECHARGEABLE BATTERIES ARE OUTLAWED, ONLY OUTLAWS WILL HAVE THEM!

One of the first major instances of a government banning sales of nickel-cadmium batteries is threatening to rear its ugly head in Sweden. The environmental agencies there are determined to keep Ni-Cds from polluting the environment and have enforced restrictions on these cells with an "Environmental Tax" on every cell. This fee will be used to clean up dump sites, but more importantly, to tax the Ni-Cd cell out of existence. Unlike the U.S., where there is a recycling program funded by all the manufacturers who use Ni-Cd batteries, Sweden has no such program (because of its small size); instead, it is taking the same approach as used in the U.S. to eliminate the use of fluorocarbons in aerosol containers. There was no immediate ban on their use, but a special tax on them was increased periodically until they became too expensive to use, and companies were forced to come up with an alternative solution.

The proposed "Environmental Tax" in Sweden translates into approximately \$12 for one 7.2V pack. That would raise the cost of an entry-level sport pack with a street price of \$21.99 to \$33.99 ... a staggering increase. Of course, this is just the beginning; it will not end until Ni-Cd battery sales are nonexistent in Sweden.

In the U.S., we are lucky that the RBRC was set up to maintain a recycling program at no cost to the consumer or retailer. This program allows the continued use of Ni-Cd batteries in the U.S., permits the R/C hobby to continue to grow and will prevent what's happening in Sweden from happening here. Of course, this good news for the U.S. depends on all Ni-Cd battery users to recycle their old cells. If this does not happen, we will likely face the fate that is about to befall R/C'ers in Sweden. That is why the RBRC and Sanyo urge you, the consumer, to live up to your responsibility and use the recycling containers at your local R/C shop to dispose of your used cells. Of course, the dealer at your R/C shop also needs to share this responsibility by properly disposing of your used cells. And, of course, dealers also need to share in this recycling responsibility by displaying the RBRC recycling containers in a highly visible area in their hobby shops and encouraging consumers to recycle.

Remember, this hobby belongs to all of us, and we all need to work together to make sure it continues.



Finding those Lost E-Clips

Most R/C car kits come with a "spare parts bag"—and with good reason. Those tiny E-clips, setscrews and diff balls can easily disappear from your work table—usually into deep-pile carpeting! To help make the hunting process easier, I combined an old pinion-gear Allen wrench with a strong, round hardware-store magnet. Regular JB Weld® epoxy holds the magnet on the wrench tip, and this "part probe" does a great job of locating missing R/C car bits.

Another option is to just buy a big magnet, like the no. 64-1877 ceramic-type model that sells for less than two bucks. But either way, keep a good, strong magnet in your R/C toolbox at all times; if you do, you may never need to open that spare parts bag—ever.



A word of advice

When it's time to try out your finished R/C chariot, choose your first location carefully. Numerous novices use their living room floor as a test track, and this can lead to friction. What kind of friction? Well, imagine running into your aunt's antiques, the family cat, or, worst of all, someone's tender ankle! I'm sure you get the picture. R/C cars, especially those just assembled, can damage household stuff—just something to consider.



AND IN CLOSING ...

Believe it or not, building R/C vehicles can be enjoyable as long as you're sensible. Just be sure to take your time, pay close attention to the assembly procedures and, if you do encounter problems, seek assistance. Check with the local hobby dealer, the car's manufacturer, or the nearest R/C track, and you should obtain the info/help you need.

And since you're perusing this article, you've already begun the learning process by reading *R/C Car Action*. So keep reading, thinking and tinkering. Who knows? In time, you could become your area's designated R/C car troubleshooter.

**Addresses are listed alphabetically in the Index of Manufacturers on page 193.*

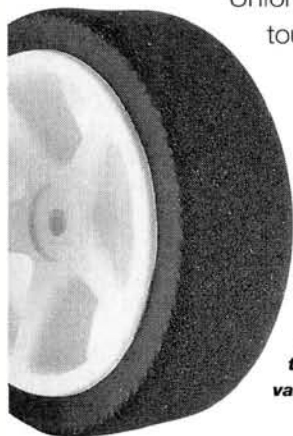
by George M. Gonzalez

Mount Foam Tires

Give Your Touring Car a Set of Foamies

BECAUSE OF the growing popularity of touring cars in the U.S., many indoor R/C racing facilities have opened classes for them. But a lot of these indoor tracks cater mostly to 1/12- and 1/10-scale pan-car racing, and the surface of choice for these cars is carpet.

Unfortunately, the rubber tires that are typically mounted on touring cars do not work very well on carpet.



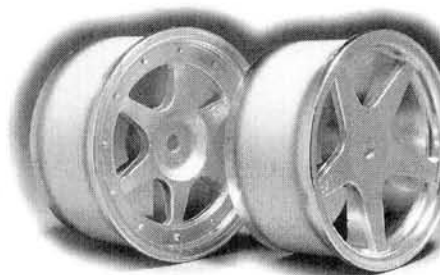
Many tire manufacturers offer mounted and trued foam tires (such as these from Schumacher), as well as replacement donuts. Kawada offers replacement touring car donuts in various compounds.

Fortunately, companies such as HPI*, Schumacher*, Yokomo*, Kawada*, Roadrunner* and Dynamite* offer mounted and trued touring-car tires in various compounds, but they don't come cheap. For many years, 1/12- and 1/10-scale pan-car

racers have cut tire costs by mounting and truing their foam tires themselves. So why not mount foam tires on touring-car wheels? The truth is, racers all over the country are doing just that. The process is fairly simple, so if you'd like to cut your tire costs, read on. The process takes just four easy steps.

AVAILABLE COMPOUNDS

Jaco*, TRC* and CKW* (among others) offer many different compounds of foam tires (donuts) for cars with flat-pan chassis. By far the two most popular are Green (medium) and Blue (hard). Other, more exotic compounds are available, but for the most part, Green and Blue will get your car dialed on most carpet surfaces. Traction additives can also be used when necessary. For instance, if your car has a



If you don't want the hassle of removing the mounting ribs from your touring car's wheels, pick up wheels that were designed for foam tires, such as these HPI 6-spokes.

slight push, add a little traction compound to the front tires to give your car more steering. If your car has a hooking problem (oversteer), apply traction compound to the rear tires only for more rear traction.

SIZING IT UP

Pan-car front foam tires are about the same width as standard touring-car tires. Therefore, two pairs of front pan-car foamies provide a complete set of tires for your touring car. On the other hand, one pair of pan-car rear tires, which are much wider, will provide you with enough material to make either three standard-width or four super-narrow tires. Of course, it's much easier to work with pan-car front foam tires because they are already the correct width, but it is more economical to work with rear pan-car foam tires because you get more rubber for your money. Keep in mind, too, that you can make your touring-car foam tires any width you want. Remember that touring-car wheels have a slightly larger diameter than pan-car wheels, so the foam tires will have to be stretched slightly to fit them.

Here's everything you'll need to mount foam tires on your touring-car wheels.



Things You'll Need

- **Touring-car wheels:** any touring-car wheel can be modified to accept foam tires; however, HPI, Yokomo, Schumacher, Kawada and many other manufacturers sell wheels that are designed for foam tires. These wheels don't have mounting ribs, and this allows the foam tires to be slipped on. If your wheels do have mounting ribs, you'll have to remove them with a Dremel tool or with a tire truer (more on tire truers later).

- **Foam tires:** you'll need to pick up some foamies. I suggest you have six tires in two different compounds for your touring car: a set of four Green-compound tires and a pair of Blue-compounds. With this combination, you'll be able to dial in your car to any carpet surface. You could always add traction with liquid traction compound if necessary. We also highly recommend that you start by mounting pan-car front tires on your touring-car wheels; as your skills improve, you may want to try cutting up wider pan-car rears into various widths and checking the results on the track.

- **Glue:** 3M rubber contact cement works the best, but it takes a while to cure (usually several hours). If you need immediate results, a thick (slow drying) CA does the job just fine and only requires a couple of minutes' drying time.

- **Tire truer:** yeah, I know, these things are expensive. But most indoor carpet tracks have a track-side tire truer available to all racers. The truer must be equipped with a hex-hub adapter for touring-car wheels. If your track doesn't have one, maybe you and your racing buddies could split the cost of one. You must true the foam tires after they've been mounted on the touring-car wheel; there's no way around it.

- **Shop file:** use a shop file to round off the flat edges of the foam tire.

- **Hacksaw:** if you choose to give your touring-car tires custom widths, you'll need a hacksaw.

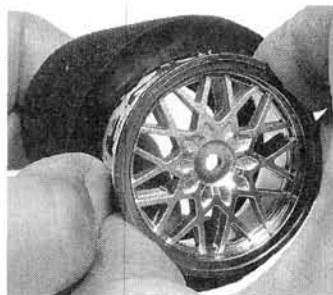
- **Callipers:** to measure tire diameter.

1 Grind the mounting ribs off the touring-car wheels.

Do not remove the outside rib; this is a reinforcing rib that's needed to keep the wheel rigid. (Remember, grind off only the mounting ribs.) This step will take about 10 minutes per wheel. You could also mount the wheel on the tire truer and grind off all the mounting ribs with a shop file. This method would save a lot of time. (If you've purchased wheels that are designed for foam tires, you can skip this step.)



2 Mount the tires on the wheels.



You'll need to stretch them a bit to make them fit. Next, slide the tire all the way against the outside reinforcing rib. You may need to lift and pull a little to mount the foam tire as straight as it can be on the wheel.

3 Glue the tire to the wheel.

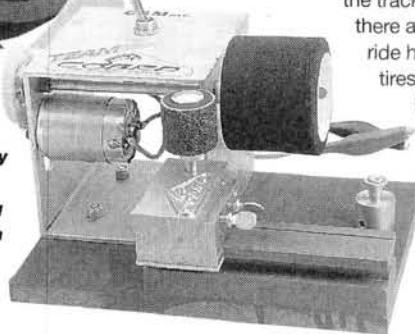
Glue the tire to the wheel using one of the following methods: use contact cement, or if you need immediate results, use thick CA. You'll need to lift up the edge of the tire to apply the glue. Use a flat-blade screwdriver to lift up one section at a time until you've applied the CA evenly around the tire. Repeat this procedure for each tire.



4 True the tires.



Tire truers are a must for mounting foam tires. They are expensive, but most racing facilities have a community tire truer.



Do this only after you're certain the glue has dried, and always wear safety glasses. There is no rule about tire diameter, but generally, you want your car to be as low as possible without scraping the track surface. Of course, there are other ways to set ride height, but you true the tires so all four of them have the same diameter. A little experimenting will be necessary to find the right tire diameter.

Believe it or not, that's all there is to it. If you install your own foam tires, you'll have an almost unlimited selection of compounds. You could even experiment with some of the exotic natural-rubber compounds offered by Jaco and other

companies. And you can make your tires any width you like: wide, narrow, super-narrow, super-duper-narrow; you get the picture.

**Addresses are listed alphabetically in the Index of Manufacturers on page 193.*

racing

From the track to the parking lot.
This is the R/C action as **you** see it.

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Send photos with captions to "Grassroots Racing," Radio Control Car Action, 100 East Ridge, Ridgefield, CT 06877-4606.

call now!

Whether you're a dealer or just a bunch of fun-lovers in search of a race program, call now! Here are a few hot-line numbers to call if you have any questions, or if you'd like to start a program in your area.

**Bolink
Legend Series**
(404) 963-0252

**Tamiya R/C
Championship
Series**
(800) TAMIYA-A

**Kyosho R/C
Sport Racing**
(800) 682-8948
ext. 085F

**Hobby Shack
Parking Lot**
(714) 964-8846

**Hobby Town USA
Parking Lot**
(402) 434-5050

**Trinity Street
Spec Series**
(908) 862-1705

Record-Breaking Race

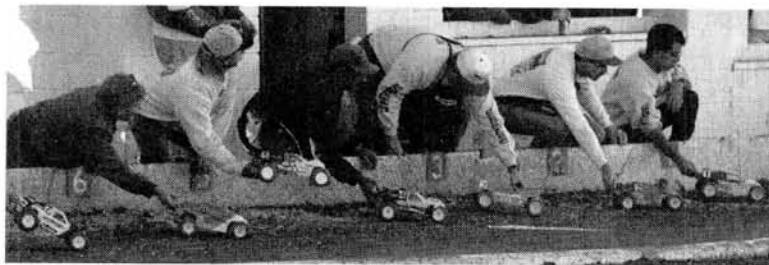
The Kingsville Racing Connection in Kowloon, Hong Kong, has no permanent on-road track, so they hold "race meetings"—as Hon-Kuen Tsoi, president of the Connection, put it—at a hard-surface football pitch nearby. They mark out the course (below) using rubber tubing and painted tires. An average of about 100 people attend the meetings, but on March 9, 1997, the drivers' stand (right) was completely filled with a record 392 cars! Competition was fierce, especially in the touring car classes, in which a fraction of a second separated the top 10 finishers.

RACE DETAILS	256 touring-car entrants
	101 1/12-scale racer entrants
	20 touring-car endurance race entrants
	15 Pro-Ten entrants



So Cal or Bust!

One of the things Patrick Ytting and his father wanted to do when they arrived in the U.S. from Denmark was to visit So. Cal. Raceway, then in Garden Grove, CA. So they cruised the streets in their rented Chevy Astro-Van until they reached So Cal's doorstep, where Patrick's father took this picture of him. Once inside, Patrick met and was photographed with Brian Kinwald, and he watched several of the other pros show their stuff on the course. During Patrick's two visits to the raceway, the crowd—both in the pits and in the stands—was very friendly and inquisitive about the R/C racing scene in Denmark.



The pit crew gets ready to let the trucks roll as they wait for the gun to go off at the start of the 1/10-scale 2WD Truck A-Main.

Mixing with the Pros

In June, you read A.R. Flatbush's account of the Hemet Gas Challenge in California. Well, Joe Senff had a somewhat different experience when he traveled to race in California. His grandson, a friend and he traveled from Oregon to Hemet for the race. He was very excited and nervous because he would be able to watch the pros race and compete with them. Joe raced two of his qualifiers with Cliff Lett and Mark Pavidis, who were extremely helpful with setup tips, but unfortunately, he didn't make it to the A-Main.



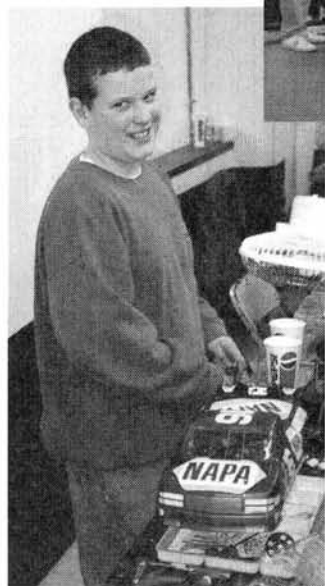


The Last Show

This large group of racers gathered for the final showdown at Pendleton's Race World. Local racers were fortunate to mix with some of the professionals—including the Parma PSE team—throughout the weekend.

Matthew Erich, R.J.'s son (left)—who missed the NASTRUCK A-Main by just $\frac{2}{10}$ second—works on his truck in the pits. With help from NAPA United Brake Division of Central Indiana, Parma and Woods ECT, Matthew had quite a ride at the track's final event.

Chris DeWeese (right), a local racer at Pendleton's Race World Inc. in Pendleton, IN, stands on the track following the final "Kulwicki lap" for this track. After this major final event on the first weekend in March, the track closed its doors forever.



Feel the Fever

R/C'ers all over New Hampshire will descend on Concord for Race Fever Weekend '97 this July. These photos—from last year's event—show how popular the weekend is with residents. There must be thousands of spectators in this crowd alone. Started to stir up interest in R/C cars, the weekend showcases drag, carpet and asphalt racing. Race organizers like to brag, "If they have it full-scale, we have it in R/C!" Head organizer Wayne Hall would like to thank Chamber of Commerce members Valerie Lynn, David Segal and Marc Yasewicz as well as Collectables 106, Roberts Railroad and all of his R/C friends for their support of the obviously successful event!



Joe captured this great perspective of the track during a break in racing action.

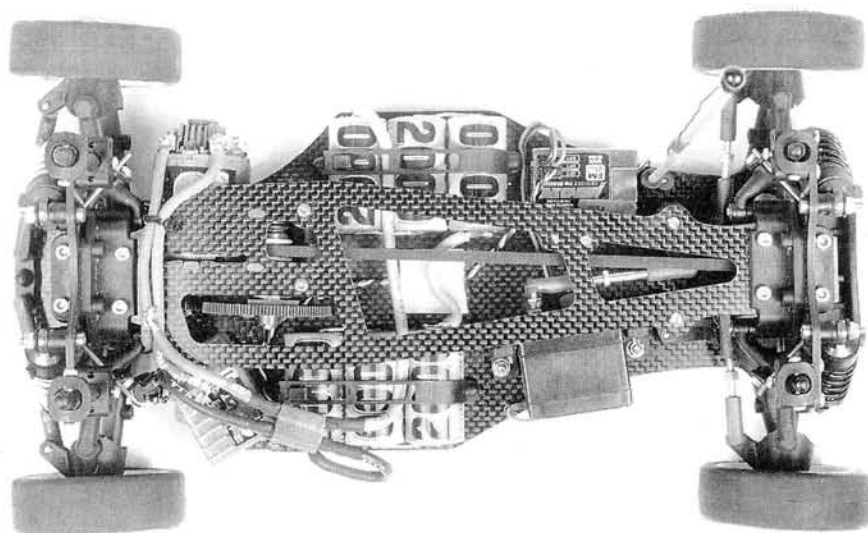
Tuning and Modifying the

SCHUMACHER

S.S.T.

WHEN I FIRST reviewed the Schumacher* S.S.T. 2000 back in the December '96 issue, I was very impressed. It's reliable, adjustable, feature-filled and, most important, reasonably priced. As a matter of fact, I like it so much that when we compiled all the top touring cars for our "Sedan Shootout" (January '97 issue), I picked it as my top choice. If you look back to that issue, you'll also see that the S.S.T. 2000 was edged out of the overall victory by the Tamiya TA03—but by only one point! Since then, I've been working very closely with the car, and my opinion is very much the same: it's my favorite tourer by far. Here's what I've done to it since the initial review.

by John Howell



- **Rebuild.** Originally, the S.S.T. came to me assembled, so first, I completely disassembled the car. While I had it taken apart, I rebuilt the diffs because I had never been completely satisfied with their smoothness (more like lack thereof). Once I had rebuilt the diffs, it was smooth sailing, and I haven't had a problem since.

- **Chassis.** I replaced the stock, fiberglass, stick-pack chassis with Schumacher's carbon-fiber upper and lower saddle-pack chassis set (part nos. U1902M and U1903N). Before I put the chassis plates on the car, I wet-sanded their edges smooth under running water in my kitchen sink and then CA'd the edges so that they wouldn't split. They now look and feel ultra-smooth. The saddle-pack chassis gives the car a lower center of gravity and helps it transition through turns faster than a comparably equipped car with a laterally mounted stick pack.

After running the car for a while, I noticed that the chassis' rear end had been scraped by the pavement. To prevent it

As you can see, the car looks completely different from the last time you saw it in our December '96 issue. The most noticeable upgrade is the graphite saddle-pack chassis, but if you look closer, you'll see that the car has been heavily modified throughout.

from being ruined, I covered it with a small piece of Team Associated* chassis-protector film (no. 6312). While running the saddle-pack chassis, I noticed that the belt-tensioner system has been eliminated. I called the folks at Schumacher, and they told me it isn't needed when using the saddle-pack chassis. I'll take their word for it; I can tell you this though: I haven't had a single belt problem since I converted to this chassis.

• **Drive train.** I installed one of Schumacher's alloy, one-way pulley sets (no. U1910X) and an alloy layshaft (no. U1913B). The one-way pulley is hard-anodized and has a needle-roller clutch that gives it the "one-way action," and I like this design much more than a typical one-way differential. With this pulley, you can have standard full-time 4WD and 4W braking simply by inserting a locking pin in the one-way unit—pretty slick, huh?

I replaced the standard drive shafts with Schumacher's new, smooth, Blade drive shafts (no. U1917F) and, with the new Blades, I used Schumacher's new hardened alloy diff outdrives (no. U2006F—female, U2007G—male).

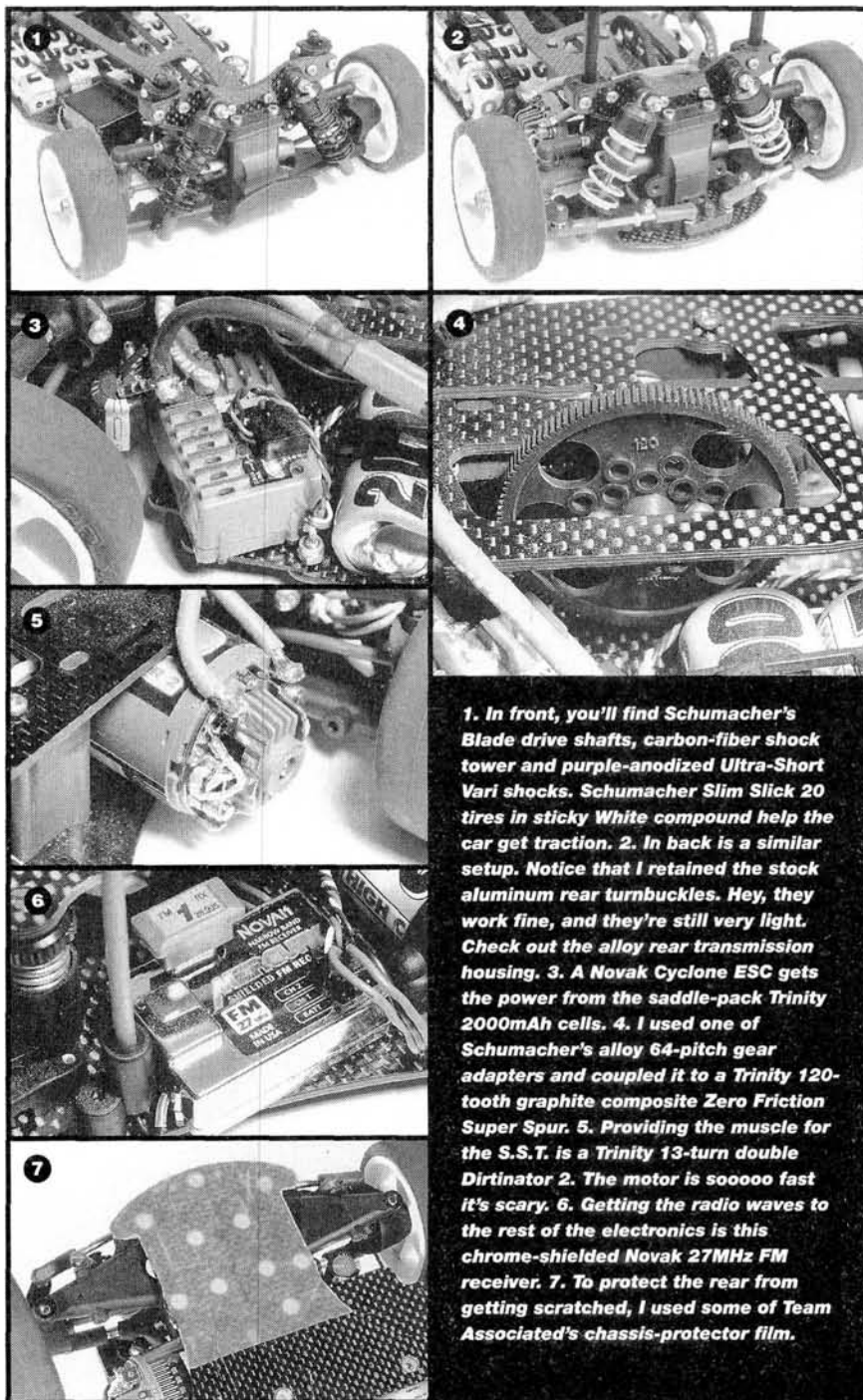
In the rear went Schumacher's new (no. U1527O) 4mm-wide rear drive belt (the kit's standard belt is 6mm). The narrower belt improves the drive train's efficiency because it produces less friction. To run it on the rear diff, I had to install wider pulley flanges (the same flanges as used on the front diff—no. U1501O).

Finally, for smoother running, I used Schumacher's new purple-anodized, aluminum 64-pitch gear adapter (no. U2014P) mated with a 100-tooth Trinity* graphite composite Zero Friction Super Spur gear (no. SG100) and a Trinity Zero Friction 28-tooth pinion (no. M6428). I also like having 64-pitch gears on my car because more subtle gearing options are available. Two Yokomo* titanium screws hold the Trinity spur in place.

• **Suspension.** I replaced the stock plastic shocks with two pairs of Schumacher's purple-anodized aluminum Ultra-Short Vari Shock Absorbers (no. U1559U—one pair). The shocks are ultra-smooth and they keep the car as low to the ground as it can be. To help keep the shock-shaft action smooth, I coated their seals with a liberal dose of Noleen motorcycle shock lube (available at most motorcycle shops). For springs, I used Schumacher's Spring Tuning set (no. U1921K). Right now, I have the car set up with Black springs up front and Gray in the rear. I filled the front shocks with 30WT oil and used 35WT in the rear.

To help stabilize the car when it's going fast through the sweepers, I installed Schumacher's swaybar set (no. U1919H) both front and rear.

Rear anti-squat is set at 1.6mm (one thin



1. In front, you'll find Schumacher's Blade drive shafts, carbon-fiber shock tower and purple-anodized Ultra-Short Vari shocks. Schumacher Slim Slick 20 tires in sticky White compound help the car get traction. 2. In back is a similar setup. Notice that I retained the stock aluminum rear turnbuckles. Hey, they work fine, and they're still very light. Check out the alloy rear transmission housing. 3. A Novak Cyclone ESC gets the power from the saddle-pack Trinity 2000mAh cells. 4. I used one of Schumacher's alloy 64-pitch gear adapters and coupled it to a Trinity 120-tooth graphite composite Zero Friction Super Spur. 5. Providing the muscle for the S.S.T. is a Trinity 13-turn double Dirtinator 2. The motor is sooooo fast it's scary. 6. Getting the radio waves to the rest of the electronics is this chrome-shielded Novak 27MHz FM receiver. 7. To protect the rear from getting scratched, I used some of Team Associated's chassis-protector film.

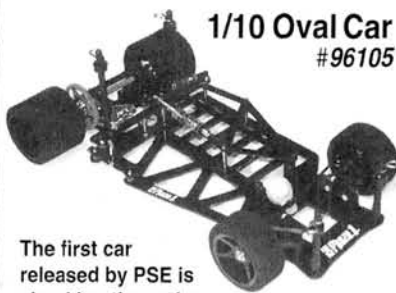
nylon washer), and I run 2 degrees of rear toe-in (zero up front). The rear has 1 degree of negative camber; up front, camber is set at zero.

• **Electronics.** This time around, I wanted to try out Novak's* new Cyclone ESC (no. 1765) and chrome-shielded Mercury receiver (no. 2327). I programmed the Cyclone's user selectable profile to the Touring Car setting. To steer the car, I stuck with the servo that I used in the review—an Airtronics* 94157. A Trinity 13-turn triple Dirtinator 2 (D2313) and a 6-cell 30A 2000mAh VIS-Matched pack get things moving.

• **Tires and wheels.** The kit tires are excellent performers, but I just had to try out a set of Schumacher's new ultra-narrow Slim Slick 20 treads in super-sticky White compound (no. U6632W—one pair). I put S.S.T. Medium "Sponges" (no. U6618I) inside the tires, and I mounted them on Schumacher's 20/190 dyeable white 5-spoke wheels (no. U2003C). The wheels widen the track of the S.S.T. to the IFMAR-legal width of 190mm.

• **Miscellaneous.** A few other Schumacher hop-ups round out the car: purple-anodized alloy rear transmission housing (no. U1563Y), alloy upper transmission

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.030 Narrow Clear Body w/Spoiler #99039

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2ND LOOK—SCHUMACHER SST

housing (no. U1867R) and alloy lower transmission housing (no. U1745Z). They're definitely the hottest-looking hop-ups I've added to the car.

Did you notice that I didn't replace the standard turnbuckles and hinge-pins? To be honest, the car is so overwhelmingly cool looking that I just plain forgot to add them, and the stock ones work fine. An impartial observer jokingly pointed out that I haven't used all the available hop-ups. As scary and as unbelievable as it might sound and look, there are S.S.T.s out there that are even more trick ... for now that is.

• **Performance.** The first time I ran my "new" S.S.T., these are the thoughts that popped up in my mind. This is a fast car. Let me rephrase that: it's a fast car that handles well at high speeds—at any speed for that matter. Any R/C car can be fast: just toss in a hot motor, and the car will move quickly. But a truly fast car is so because it handles well at speed. I've driven touring cars that handled admirably at low to moderate speeds yet were really twitchy when I tried to put the power down. Why? Their chassis and suspension systems weren't up to the task. The S.S.T.'s are.

I've also found a new favorite tire. Super-narrows are hot handlers, and the ones I use here are no exception to that. Schumacher's White compound is ultra-sticky, and on smooth, clear parking lots,

they really shine. I've just been told that super-narrows are no longer legal for competition in Japan. Will they be banned here, too? We'll wait and see.

As I said earlier, you can toss a fast motor into any car and it will go fast. Well, it's safe to say that if that is your only goal in R/C, look no further. The Trinity D2 I used was way too fast! It was fun watching the S.S.T. dart around like a bullet, but I think the 13-turn triple wind is too much for this application. I plan to switch to a slightly milder wind.

Handling the ballistic fast motor and killer cells is a demanding job, and the Novak Cyclone was completely up to it. This high-quality unit is one wicked-smooth ESC; I have nothing but good things to say about it (well, except for soldering on that capacitor; damn, that was a pain!). And as much as I liked the Cyclone, I was equally pleased with the Mercury receiver; my car never glitched, and it was smooth even when pretty far away from me.

As it stands, the car's handling is great, but if I were to change anything, I think I would swap the Black front springs for Gray ones and the rear Gray springs for Blue ones. Other than that, I wouldn't change a thing.

I can't wait to go out to the local lot with Frank and George and smoke them!

*Addresses are listed alphabetically in the Index of Manufacturers on page 193.

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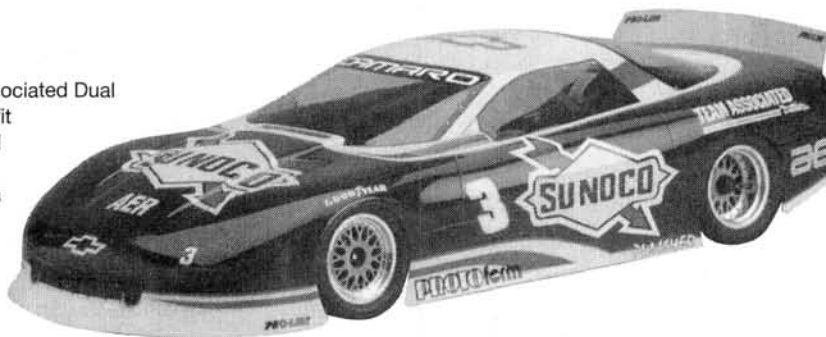
PROTOFORM

1997 Camaro DS

Specifically designed to fit the Associated Dual Sport, this Camaro body will also fit most superspeedway and on-road chassis. The low-profile sleek body design comes complete with an add-on spoiler.

Part no.—1411; price—\$19.95.

Protoform, distributed by Pro-Line, P.O. Box 456, Beaumont, CA 92223; (909) 849-9781; fax (909) 849-2968.



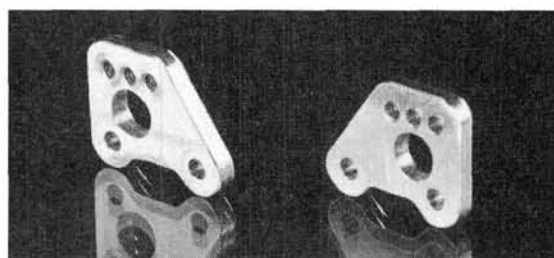
CMI

Heat Peak AC/DC Charger

This automatic AC/DC charger will restore life to battery packs of any size and charges at 4 amps. Its other features include a spring arm battery holder, two-color LED indicating charge and trickle mode, thermal sensors for monitoring battery temperature, three-fuse protection, Tamiya and Kyosho connectors, two-way universal output posts with hardware, "outdoor bright" light monitors and 12V input jacks.

Part no.—1011; price—\$49.95.

Chicago Model Intl., P.O. Box 170, Deerfield, IL 60015; (847) 735-8500; fax (847) 735-8516.



RACEWORKS

Rear Arm Shock Mounts

Designed for use with the Associated RC10GT and RC10T2, these shock mounts are available in polished aluminum and hard-anodized blue. They provide an additional mounting location to handle tough racing conditions and are lightweight but sturdy enough not to break or flex under the worst conditions. Thinner than the original mount, this one allows the shock to be perpendicular to the rear arm and shock mount for a smooth working suspension.

Part no.—RW-1011; price—\$18.95.

Raceworks, P.O. Box 4261, W. Richland, WA 99353; (509) 735-1052.

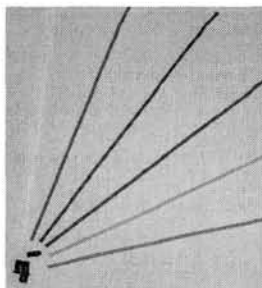
DYNAMITE

McCoy MC59 Power Plug

The new MC59 Power Plug was designed to provide a higher heat range than the venerable MC9, so it is ideal for running nitro-powered R/C cars in colder weather. For running in hot weather, stick to the original MC9.

Part no.—DYN2508; price—\$7.95/pack of 2.

Dynamite, distributed by Horizon Hobby Distributors, 4105 Fieldstone Rd., Champaign, IL 61821; (217) 352-1958; fax (217) 352-0355.



PARAGON RACING PRODUCTS

Nimrod Fluorescent Whip Antenna Line

This improved antenna line is made of a stronger plastic than it was previously and is available in brighter colors for an even hotter look. Each six-tube package includes orange, green, magenta, blue, red and yellow tubes, antenna base and tip.

Part no.—NR090; price—\$5.75/package of 6.

Paragon Racing Products, 240 Industrial Blvd., Waconia, MN 55379; (612) 442-6364.

TRINITY

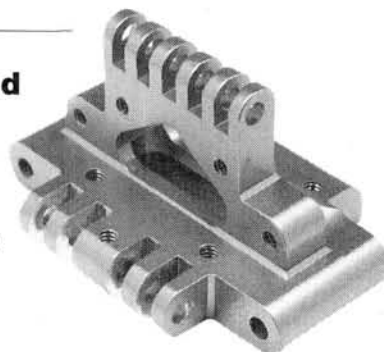
Team Kinwald Front Bulkhead

This blue-anodized aluminum front bulkhead for the Team Losi Double-X 'CR' buggy and Double-XT 'CR' truck can be bolted right on as a replacement for the plastic kit piece.

Constructed of heavy-duty aluminum, this bulkhead is less prone to snapping during a crash and possibly causing you to lose the race.

Part no.—TK3007; price—\$29.99.

Trinity Products, 1901 E. Linden Ave., #8, Linden, NJ 07036; (908) 862-1705; fax (908) 862-2787.



KO PROPO Super- Small Receiver



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Part no.—KOPL3527; price—\$99.99.

KO Propo; distributed by Great Planes Hobby Distributors, 2904 Research Rd., Champaign, IL 61826-9021; (217) 398-6300; fax (217) 398-0008.

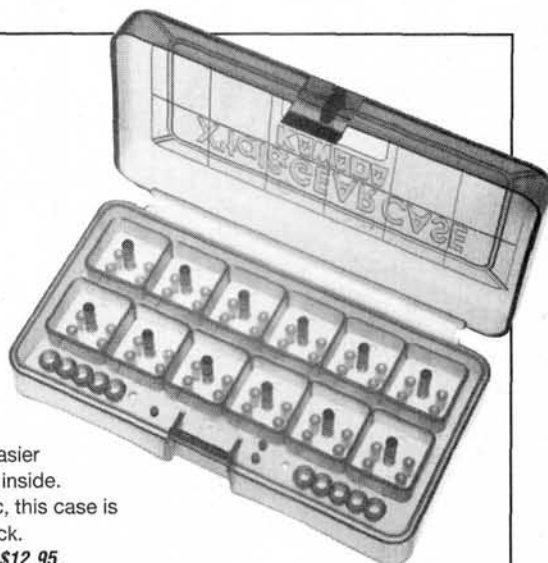
KAWADA Crystal/ Pinion Case

This case is perfect for storing and transporting your crystals and pinions. Its small size lends it to travel, and its transparent yellow color makes it easier to keep track of what's inside.

Made of durable plastic, this case is a must-have for the track.

Part no.—SK-17; price—\$12.95.

Kawada; distributed by Sunrise R/C Ltd., 1703 Utah Ct., Milton, WA 98354; (206) 874-8508; fax (206) 838-7603; and GHI, 2378 N. Orange Mall, Orange, CA 92865; (714) 921-0322; fax (714) 921-0380.



BOLINK '65 Mustang Fastback Classic

Modeled after one of the first Fastback Mustangs, this 1/10-scale body includes custom details for real scale looks.

Part no.—BL-2262; price—\$19.95.

Bolink R/C Cars Inc., 420 Hosea Rd., Lawrenceville, GA 30245; (770) 963-0252; fax (770) 963-7334.



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This body fits all the popular, narrow, gas or electric touring car chassis, including the Roadrunner, Yokomo, Tamiya, Kyosho and HPI kits. This ROAR-legal body is made of .030 Lexan and includes a wing.

Part no.—E-1014; price—\$18.95.

Elite Performance R/C Products; distributed by GHI Hobbies, 2378 N. Orange Mall, Orange, CA 92865; (714) 921-0322; fax (714) 921-0380.



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Associated Electrics Inc., 3585 Cadillac Ave., Costa Mesa, CA 92626; (714) 850-9342; fax (714) 850-1744.



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FLORIDA WINTER CHAMPS

(continued from page 117)

confusion, with cars crashing left and right, and at the buzzer, it was Mellin first, Sohrab Tavokoli second and Saxton third.

4WD Modified

• A1. The highly anticipated 4WD A-Main started with Jukka Steenari taking over the lead followed by Masami Hirosaka and Scott Brown. Soon, Hodapp made his way around Brown to take third. In the meantime, Kinwald had moved up from the back of the pack and not long afterward, Hodapp had mechanical problems, and he dropped back. Steenari maintained his lead to the end, followed by Masami and Kinwald.

• A2. In a repeat of the first A-Main, Steenari jumped out to an early lead, followed by Masami. Behind Masami in third was Pavidis. Soon into the race, Pavidis bobbled, allowing Brown to take third. Masami and Steenari tangled, and Masami managed to take the lead. But Steenari wanted to end it there. A few turns later entering the straightaway, Steenari blew past Masami in the middle of the backstretch, and at the end of the straight, Masami spun out and found himself in fourth. Brown slid into second while Pavidis took third. Brown closed at the end, but couldn't quite catch Steenari. With two races won, Steenari clinched the overall win.

• A3. At this point, it was nearly completely dark, and I still don't know how the competitors could see their cars. Steenari opted to sit out the final race and let everyone else duke it out. Masami took the lead and never looked back. He easily went on to win (well, not too easily; I'm sure none of them could see well!), and he was followed over the line by Pavidis and Hodapp.

FINAL THOUGHTS

In the end, almost every team had reason to be happy. Teams Losi, Associated and Schumacher can all be satisfied with their drivers' performances. Congratulations to Travis Scrambling, Brian Kinwald, Mark Pavidis and Jukka Steenari for their fantastic wins. Thanks to Pops Losi for his hospitality and to John Grant and the West Coast R/C Club for all their help.

TRINITY SWITCH BLADE

(Continued from page 75)

With my other cars, I could never break the 51-lap barrier, but I'm pleased to announce that with the SB10SS, I smoked my old record and turned 55 laps. I was very pleased with the testing. As I get to know the car better, future trips to the track and more experimentation with setup should yield even better results.

FINAL THOUGHTS

Overall, the car is a solid, consistent performer made of high-quality ultra-light parts. There are many ways to tune it. Some steps in the manual are a

bit confusing, so pay attention and read everything thoroughly. Most important is that with this car, you won't need a pile of aftermarket parts to get hooked up and riding on rails at your local track. If you're looking for a new oval car, this is one you must check out! Armed with this new weapon from Trinity, I'm sure I'll have no trouble cutting the competition down to size!

*Addresses are listed alphabetically in the Index of Manufacturers on page 193. ■

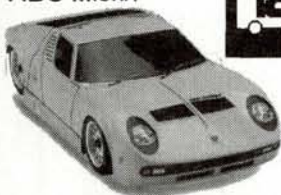
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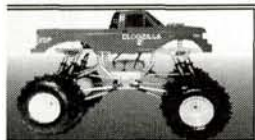
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YANKEE DODGE VIPER

(Continued from page 80)

Part two of the testing took place on a large, vacant parking lot. My "road-course" consisted of some orange cones and sand-filled pop bottles, and the 1/4-scale car felt fine as it negotiated the circuit. The lot's surface was bumpier than the oval's, and I heard the body shell scraping at times. So I trimmed 3/16 inch off the shell's nose and sides; that was the end of the scraping. I also found that increasing the engine's idle speed up to just before clutch engagement helps to keep the car's momentum up from corner to corner. But no matter which cornering speed, angle, or pivot point I chose, the Yankee Viper reacted the same—fantastic!

The simple truth of the matter is that the Viper didn't require much—if any—tuning throughout the entire test. This could explain why the chassis is used on six different Yankee vehicles and why it's currently a class winner in European 1/4-scale racing circles!

FINAL THOUGHTS

Fact: straight from the box, the CEC/Yankee Dodge Viper is a great large-scale R/C car. CEC will completely set up any Yankee (including body/graphics work) prior to shipment. So whether you want a basic, assembled/no-radio car or an RTR, you're set with this R/C car lineup.

As for the Viper sports car tested here, I spent less than five bucks (minus fuel) on all the mods. And no matter where I took the Viper, it drew a crowd. R/C racers, non-racers, kids and adults wanted to know about the car.

So the bottom line is this: the gas-powered Viper is a well-laid-out, well-built and sharp-looking 1/4-scale car. And since a full-size Viper goes for around 80 grand, the Yankee replica looks better suited to most folks. Plus, you don't have to carry insurance on the R/C version!

*Addresses are listed alphabetically in the Index of Manufacturers on page 193.

TRINITY STREET SPEC NATS

(Continued from page 128)

Verbonitz swapped paint and positions fighting for precious third. With under 1 minute to go, Verbonitz decided he would occupy the third podium position. The race finished with McCauley in first with a 61/4:02.8, Schreffler second and Verbonitz third.

• **Pro Spec.** As I mentioned earlier, all the sponsored drivers were put into the Pro Spec class to make it fair for the unsponsored drivers. After the Main, the number of laps proved that even though you're sponsored, it doesn't mean you will destroy the regular spec drivers' times.

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FLAG-1 THREE HOURS ENDURANCE RACE

1st Place: R/C Control World Magazine Team (Miashita, Takahashi, Ishii)
2nd Place: F. Planning Team (Kitade and Suzuki)
3rd Place: Mugen Seiki Sting Team (Sanada, OOsaka and Kawamoto)

The Pro Spec winner finished a lap down from the Street Spec winner! Racing was just as exciting, though. Shane Kocher TQ'd and stole the show by leading from start to finish and lapping the field. The real action was behind him. Mike Wood had his hook set and was reeling Kocher in when he encountered mechanical problems at the 2-minute mark and was forced to drop out. Jake Flurer, in third at the time, was automatically bumped up, but he couldn't catch Kocher. Flurer did, however, have his hands full with Dave Carpenter, who was on Jake's spoiler. Flurer managed to beat Carpenter to the line by 0.002 second.

SPEC PUTS THE FUN BACK IN RACING

The affordable world of spec racing is receiving the attention of both novices and experienced drivers. The rules ensure that all entrants' cars are basically the same, so the only advantage any driver has is his skills. Congratulations to winners Shane Kocher and George McCauley and to the rest of the drivers. The staff and sponsors also deserve a pat on the back for a well-run show. Trinity provided over \$1,000 in door prizes and gifts, such as pit bags and cars for the winners. Hopefully, Street Spec will be around a long time, and it will bring a lot of new talent to R/C racing.

SUPER ATHLETE

(Continued from page 68)

This setup rips! When you pin the throttle, the low-profile tires grow like drag slicks, so until you get the hang of the Athlete's power and handling, it's definitely better to "blip" the trigger on the straights. This isn't even Mugen's hottest engine! Mugen has claimed that the .21B puts out 2.1hp at 28,000rpm, while the lighter .21SP cranks out 2.33hp at 32,500. I'm also impressed with the pipe, as it provides great mid-range and top-end power without loading up or flaming out off idle. Right out of the box, the carb settings are perfect for break-in. Gradually lean it out during the first two tankfuls.

I have to admit that I never drove the car with the extreme toe-out delivered by the suggested steering-arm lengths. Sure, this would make the Athlete a cheetah in tight turns, but when going fast down the straights, it would have wandered. I set the buggy up with 1mm of toe-out and

set the rear brake to drag slightly with the throttle at idle. This plants the front end for corners and gets back some of the turning agility lost by decreasing the toe-out. With 1 to 2mm of negative camber on all four corners, the Super Athlete hooks up and hauls off turns, and I'm really impressed with its balance. In the rough, it rips! Compared with my flat-chassis 4WDs (Inferno, HODR and Thunder Tiger Mirage), I noticed that the kicked-up chassis also decreases bump-steer.

Going into corners, I initially noticed some rear-wheel lifting, but I dialed most of it out by adjusting the rear swaybar and by moving the upper front shock mount to the outermost position. This stiffens overall action a bit and reduces body roll. The stock shock oil and the shock springs provide a decent setup for smoother off-road tracks, but they're too

soft for the monster jumps where I play. Because the kit doesn't include optional shock pistons, you'll have to dial damping with silicone oil, springs, preload and position. I went with Mugen's optional heavy-duty shock springs, front and rear.

Overall, I'm totally stoked with the Mugen Super Athlete. It's fast, agile, dependable, tough and easy to tune. Design and workmanship are excellent. With the Kyosho MP-5, the Super Athlete represents the beginning of a new era in 1/8-scale 4WD off-road—one in which suspension travel and handling will rival the new-generation, ultra-long-travel 1/10-scale buggies and trucks. Imagine a gas-powered Losi XX-4?! Blow it up to 1/8 scale. You're now in the Super Athlete's ballpark, so duck!

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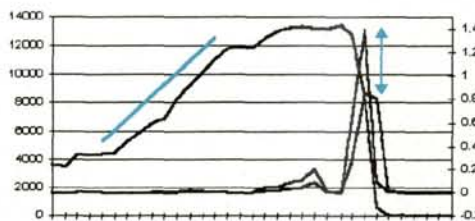
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PERFORMANCE HOBBY LITE SWITCH

(Continued from page 62)

Unfortunately, George had one of his "blank" spells and forgot to include the Lite Switch.

The Lite Switch comes in many flavors, from 4-cell to 10-cell, and custom units are available for up to 16 volts. I tested the 4- and 10-cell units. Each is stamped with the number of cells meant to be discharged, but I labeled mine with some big stick-on numbers since the two versions look so much alike. Most distinctive is the Lite Switch's businesslike red-anodized, extruded-aluminum case. Two un-stripped leads emerge from the ends of the case, which is sealed with industrial epoxy. All I had to do to get each Lite Switch online was attach my favorite connectors. The battery to be dumped is connected to the red and black leads while two polarized black leads are connected to the "load"—the discharge device. My 10-bulb, 20A discharge setup fell well within the 35A limit recommended by Performance Hobby.

With no adjustments to be made or moving parts to consider, testing the Lite Switches was pretty much a "worked/didn't work" affair. I'm happy to say that both units did their job unfailingly and as promised. As I used a voltmeter to monitor the progress of the pack being discharged, the Lite Switch gradually shut off the bulbs until they winked out with the pack at 5 volts.

To see just how badly my cells were being taxed before I got hip to the Lite Switch, I took the unit out of the circuit and ran off the remaining battery juice. I got only about 15 more seconds of a feeble glow, but the voltmeter told the real story. After the bulbs had gone out, the voltage went into a rapid free fall toward zero in a matter of seconds. I shudder to think of my past abuses!

Running off 1/2 minute or so of extra run time after a race was a piece of cake for the Lite Switch, but I had more insidious plans for the red wonder. As a torture test, I dumped five fully charged packs consecutively through the 6-cell unit. Although I cooled my bulbs and batteries with a fan, I decided to let the Lite Switch sweat. Its bright red-anodized case got very warm, but it never failed to do its job. It's tough!

Today's high-performance batteries aren't cheap and improper care can cost you big bucks. The flip side is that proper care can save a lot of green—and grief. Everyone who cares at all about prolonging the life and performance of their batteries ought to have a Lite Switch in their pit boxes. If you're a battery bruiser like me, it will pay for itself!

—Peter Vieira

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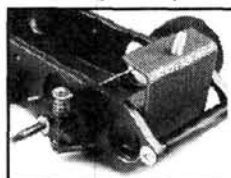
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Communication ... Communication ... Communication

This is my page—mine!

The opinions expressed on this page do not necessarily represent the opinions of the entire *Car Action* staff. Any resemblance to reality is purely coincidental. Send your correspondence, hate mail, love letters, photographs—anything you like—to Chris's Back Lot, c/o *R/C Car Action*, 100 East Ridge, Ridgefield, CT 06877-4606. My Internet address is: chrisc@airage.com.

Ya know, some mornings, I get out of bed, go to the mirror and my hair is perfect! I don't have to do a thing to it. Other mornings, I look like a troll doll that was sucked into the intake of a B-2 bomber. I'm too lazy to spend the required time to make it look right, so I don't. My patience with a hair dryer lasts about 64 seconds. "The point?" you might be asking just about now. Some days will be better than others, so deal with it in a positive way.

Some days, even running an R/C car—a clean, wholesome activity on a par with baking cookies or helping the elderly cross the street—can get you treated as if you're trying to clean windshields at a stop-light. The "man" just wants you to go away.

A short while back, we *Car Action* editors found this great—and unused—parking lot near a theater complex that was *sooo* smooth and clean—a perfect canvas on which to paint the ultimate parking-lot track.

Wouldn't you guess that not 10 minutes later, the yuppie-sheep theater manager drove over (*drove*—that's how far we were from the actual theater parking lot!) to inform us that one of his patrons had surmised that we were

selling something out of our cars—no doubt something illegal. We demonstrated our R/C cars to Mr. Authority and assured him of the benign nature of our activity. He smiled and drove back to the theater—we thought, perhaps, to heat up a fresh, fat tanker full of fake butter. In true coward fashion, however, our friend had indeed called the local constabulary, who politely told us that the theater manager wasn't comfortable with our presence. I know this disheartening event has befallen many of us.



The words "wasn't comfortable" that came from the officer's lips were the essence of the problem. The key is communication. It's human nature to fear what we don't understand—a reality we need to deal with. This particular fact of life, however, is easy to deal with.

Before you set one tire on the blacktop, talk to them, show them, let them come to understand so that they will feel more comfortable with your presence.

The following is a solution-oriented email from Brent Sanders, who talks about up-front communication and offers some very good ideas on inclusion. Remember, our hobby is the healthiest when we include, instead of exclude, those who are unfamiliar with (but who may turn out to love as we do) R/C car racing.



**A view from
the brilliance
ever present
on the Internet**

Chris,
In R/C Car Action, I see parking-lot racing constantly being shown and talked about. I live near a large corporate area and have fulfilled my dream of having a track for R/C racers and people who just want to have a good time. Here is my guide for a way to get your own track with a little time and a few free Sundays. First, this applies to any company that owns a parking lot. You must call the company and talk to someone in authority, or just make an appointment to see this person. Discuss your track ideas, and start extremely modestly. For example, say only a small area is needed and that it will be as far as possible from the offices. Second, have racing on days that the building isn't in use, like a day off for everyone (Sunday at the corporate center where I race). Try to keep everyone as quiet as possible, especially at first; you don't want the workers to complain that they can't concentrate. Also, if you can, include some employees in the R/C action. Keep a car or two in reserve—like a digger that is cheap and can take a hit here and there—for newcomers who are just watching. (Editors' note: they'll be on YOUR side before you know it!) Next, have everybody pay a dollar or two, and the winner for the day gets a cheap prize like a battery conditioner or—even more expensive—a battery pack or motor. That all depends on the people. **THE MOST IMPORTANT ELEMENT IS** always please the employees of the company; do whatever you can to be nice and courteous.

Brent Sanders
METALLIJAZ@aol.com

Brent,
Your approach is a brilliantly simple and positive solution to the problem that can benefit all racers when bringing new people into the hobby, too! Thanks for taking the time to email.
—CC